SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT (SLERA) FOR THE GULFCO MARINE MAINTENANCE SUPERFUND SITE FREEPORT, TEXAS

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1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) named the former site of Gulfco Marine Maintenance, Inc. (the Site) in Freeport, Brazoria County, Texas to the National Priorities List (NPL) in May 2003. On July 14, 2005, the EPA signed a modified Unilateral Administrative Order (UAO), requiring the Respondents to conduct a Remedial Investigation and Feasibility Study (RI/FS) for the Site. The Statement of Work (SOW) for the RI/FS at the Site, provided as an Attachment to the UAO from the EPA, requires an Ecological Risk Assessment (ERA). The SOW specifies the Respondents to follow EPA's *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA, 1997). This guidance document proposes an eight-step approach for conducting a scientifically defensible ERA:

1. Screening-Level Problem Formulation and Ecological Effects Evaluation;
2. Screening-Level Preliminary Exposure Estimate and Risk Calculation;
3. Baseline Risk Assessment Problem Formulation;
4. Study Design and Data Quality Objectives;
5. Field Verification of Sampling Design;
6. Site Investigation and Analysis of Exposure and Effects;
7. Risk Characterization; and
8. Risk Management.

Briefly, Steps 1 and 2 of the process are scoping phases of the ERA in which existing information is reviewed to preliminarily identify the ecological components that are potentially at risk, the chemicals of potential ecological concern (COPECs), and the transport and exposure pathways that are important to the ERA. This process is conducted using conservative assumptions to avoid underestimating risk or omitting receptors or COPECs, and constitutes the Screening-Level Ecological Risk Assessment (SLERA). Step 3 is the Baseline Problem Formulation that uses the results of the SLERA to identify methods for risk analysis and characterization, resulting in the identification of ERA data needs for the RI/FS. Steps 4 through 7 include formalization of the data needs, data collection, and data analysis for the risk characterization. Risk management activities are the eighth step in the process.

1.1 PURPOSE AND SCOPE

The purpose and scope of this document is to present the existing data for environmental media and conduct the SLERA. The SLERA is a conservative assessment and serves to assess the need, and if required, the level of effort necessary to conduct a baseline ecological risk assessment. Per EPA guidance (EPA, 2001), the SLERA provides a general indication of the potential for ecological risk (or lack thereof) and may be conducted for several purposes including: 1) to estimate the likelihood that a particular ecological risk exists; 2) to identify the need for site-specific data collection efforts; or 3) to focus site-specific ecological risk assessments where warranted.

The SLERA was conducted using several datasets collected as part of different environmental investigations. These datasets were obtained as part of investigations described in the Site Characterization Report prepared by LT Environmental, Inc. (LTE, 1999), and the Screening Site Inspection Report (TNRCC, 2000) prepared by the Texas Natural Resource Conservation Commission (now called the Texas Commission on Environmental Quality or TCEQ). These data were validated and flagged as noted in TNRCC, 2000. Validation of the LTE data (see Appendix A) suggests that they are of sufficient quality for a screening level evaluation. Overall, the amount of data from these two existing datasets is limited, and as a result, the data could not be used to screen out COPECs.

This document contains the following steps and key elements, which are defined in EPA guidance (1997):

Step 1

- Description of the Site setting;
- Identification of the preliminary site-related chemicals; and
- Development of the preliminary conceptual site exposure model.

Step 2

- Calculation of conservative screening-level exposure and risk;
- Identification of COPECs; and
- Identification of assessment endpoints based on the management goals for the Site.

This report concludes with a Scientific Management Decision Point (SMDP), which provides documentation for whether further assessment (i.e., proceeding with the baseline ecological risk assessment) is necessary.

1.2 SITE SETTING AND HISTORY

The Site is located about three miles northeast of Freeport, Texas in Brazoria County at 906 Marlin Avenue (also referred to as County Road 756). The Site consists of approximately 40 acres within the 100-year coastal floodplain along the north bank of the Intracoastal Waterway between Oyster Creek to the east and the Old Brazos River Channel to the west. Figure 1 provides a map of the site vicinity, while Figure 2 provides a detailed site map and shows site features and locations of previous environmental media samples (these correspond to sample identifications/locations noted in Tables 1 through 10).

From 1971 through 1998, at least three different owners used the Site as a barge cleaning facility. During the 1960s prior to the Site being developed, the Site was used for occasional welding but there were no on-site structures. Beginning in approximately 1971, barges were brought to the facility and cleaned of waste oils, caustics and organic chemicals, with these products stored in on-site tanks and later sold. Sandblasting and other barge repair/refurbishing activities also occurred on the Site. At times during the operation, wash waters were stored either on a floating barge, in on-site storage tanks, and/or in surface impoundments on Lot 56 of the Site (Figure 2). The surface impoundments were closed under the Texas Water Commission's (TCEQ predecessor agency) direction in 1982 and covered with a hardwearing surface.

Marlin Avenue divides the Site into two areas. The property to the north of Marlin Avenue consists of undeveloped land and the closed impoundments, while the property south of Marlin Avenue was developed for industrial uses and will continue to be used for commercial/industrial purposes in the future. Adjacent properties to the north, west and east of the northern portion of the Site are unused and undeveloped. Adjacent property to the east of the southern portion of the Site is developed and currently used for industrial purposes. The adjacent property to the west is currently vacant with an unused dredged slip and previously served as a commercial marina. The Intracoastal Waterway bounds the Site to the south.

2.0 SCREENING-LEVEL PROBLEM FORMULATION

Problem formulation establishes the goals, breadth and focus of the SLERA by describing the physical features of the site, the communities of potential receptors present at the Site, the selection of assessment and measurement endpoints, and potential exposure pathways. This information serves as the basis for the conceptual site model, which is used to focus the remaining steps of the SLERA.

2.1 ENVIRONMENTAL SETTING

The Site is located between Galveston and Matagorda Bays and is situated along approximately 1200 feet (ft.) of shoreline on the Intracoastal Waterway. The Intracoastal Waterway is a coastal shipping canal that extends from Port Isabel to West Orange on the Texas Gulf Coast. Designs to build the Texas portion of the Intracoastal Waterway began as early as the 1890s. Today, the Intracoastal Waterway is a vital corridor for the shipment of bulk materials and chemicals. The Texas Department of Transportation estimates that $35.5 billion worth of goods was moved over the waterway in 1986. In 1980, it was estimated that almost two million recreational boat trips used the Intracoastal Waterway and the commercial fishing industry uses the waterway for access to the Gulf of Mexico (TSHA, 2005).

The portion of the Site south of Marlin Avenue includes approximately 20 acres of upland that was created from dredged material. Prior to construction of the Intracoastal Waterway, this area was most likely coastal wetlands. Based on field observations, the area north of Marlin Avenue is tidally connected to Oyster Creek and the Intracoastal Waterway through a natural swale (draining northeast) and stormwater ditches north of the Marlin Avenue roadbed.

The portion of the Site north of Marlin Avenue, excluding the capped impoundments and access roads, is considered estuarine wetland. The soil caps and road base support a variety of herbaceous upland vegetation that is tolerant of drier soil conditions. As shown on Figure 2, there are two ponds on the north parcel of the Site, east of the impoundments.

Figure 3 depicts wetlands areas in the Site vicinity. Wetlands are the transitional zones between uplands and aquatic habitats and usually include elements of both. The wetlands at the Site are typical of irregularly flooded tidal marshes on the Texas Gulf Coast. The lower areas in the

northern half of the property are dominated by obligate and facultative wetland vegetation such as saltwort (*Batis maritima*), sea-oxeye daisy (*Borrichia frutescens*), shoregrass (*Monanthocloe littoralis*), Carolina wolf berry (*Lycium caroliniaum*), spike sedge (*Eleocharis sp*.), and glasswort (*Salicornia bigelovii*). Higher ground near the road supports facultative wetland vegetation such as eastern bacchari (*Baccharis halimifolia*), sumpweed (*Iva frutescens*), and wiregrass (*Spartina patens*). Near the road there are several shallow depressions that apparently collect and hold enough freshwater to allow homogenous stands of saltmarsh bulrush (*Schoenoplectus robustus*) to develop.

According to the United States Department of Agriculture (USDA) County Soils Maps (USDA, 1981), surface soils south of Marlin Avenue are classified as Surfside clays, and soils north of the road are classified as Velasco clays. Both soils are listed on the state and federal soils lists as hydric soils. The Velasco series consists of very deep, nearly level, very poorly drained saline soils. These soils formed in thick recent clayey sediments near the mouth of major rivers and streams draining into the Gulf of Mexico. They occur on level to slightly depressed areas near sea level and are saturated most of the year. Slope is less than one percent. The Surfside series consists of very deep, very poorly drained, saline soils that formed in recent clayey coastal sediments. They are saturated most of the year, and are on level to depressed areas near sea level with a slope less than one percent.

The property south of Marlin Avenue contains some undisturbed terrestrial or upland habitat and resident wildlife is likely limited. In addition, shorebirds have constructed nests on some of the vertical structures at the Site.

Property north of Marlin Avenue supports wildlife that would be common in a Texas coastal marsh. Based on initial observations, fiddler crabs (*Uca rapax*) are the most abundant crustacean on the north parcel. Other crustaceans found at the Site were fiddler crabs (*Uca panacea*), and hermit crabs (*Clibanarius vittatus*). The most common gastropod is the marsh periwinkle (*Littorina irrorata*). The Site is also used by a variety of shorebirds. Birds observed at the Site include great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), green heron (*Butorides striatus*), white ibis (*Eudocimus albus*), glossy ibis (*Plegadis falcinellus*), and willets (*Catoptrophorus semipalmatus*). The Site provides suitable habitat for rails, sora, and gallinules and moorhens. The Site is also used by a variety of small mammals, rodents, and reptiles.

The Intracoastal Waterway supports barge traffic and other boating activities. The area near the Site is regularly dredged and, as noted by the United States Fish and Wildlife Service (USFWS), shoreline habitat is limited (USFWS, 2005a). There is a small amount of intertidal emergent marsh in the upper end of each of the barge slips. Sand and silt has accumulated in the ends of the slips and is supporting small stands of gulf cordgrass (*Spartina alterniflora*). The remainder of the shoreline is protected by sheetpile and concrete bulkheads. The bulkheads provide habitat for oysters (*Crassostrea viginica*), barnacles (*Balanus improvisus*), sea anemones (*Bunodosoma cavernata*), limpets and sponges.

Fishing is known to occur on and near the Site. Red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), southern flounder (*Paralichthys lethostigma*) and others are reportedly caught in the area. Recreational and commercial fishermen collect blue crabs (*Callinectes sapidus*) from waterways near the Site. The Texas Department of State Health Services has banned the collection of oysters from this area due to biological hazards and they have issued a consumption advisory for king mackerel for the entire Gulf Coast due to mercury levels (TDSHS, 2005).

2.2 NATURE AND EXTENT OF POTENTIAL CONTAMINATION AND COPEC SCREENING

Data related to the nature and extent of potential contamination in soil and sediment at the Site were obtained from several reports, described below and are summarized in Tables 1 through 10. Figures 2 and 4 provide sample locations for these samples. Evaluation of soil, sediment, surface water, and groundwater data is discussed below.

2.2.1 Soil

As described in the LTE (LTE, 1999) and TNRCC (TNRCC, 2000) reports, 13 soil samples were collected from the Site and analyzed for metals (one sample was analyzed for beryllium only) while 17 samples were analyzed for volatile organic compounds (VOCs), 11 samples were analyzed for semi-volatile organic compounds (SVOCs), and eight samples were analyzed for polychlorinated biphenyls (PCBs). Two additional soil samples collected from two different locations north of Marlin Avenue and approximately one-half to one mile away from the Site

were characterized by TNRCC as background samples (a third sample was analyzed as a duplicate of one of these background samples).

Per direction from EPA during previous technical discussions, screening criteria for soil were obtained from EPA's Ecological Soil Screening Level guidance (EPA, 2003). If no value was available for a particular chemical, the TCEQ screening-level benchmarks from their ecological risk guidance (TNRCC, 2001) and subsequent updates was used. These values are generally based on no observable adverse effects levels for long-term exposures as required in Paragraph 37 d (ii) of the SOW attached to the UAO.

Metals were detected in most Site and background samples (Table 1) . The shaded cells in Table 1 highlight values that exceed screening values. It should be noted that no soil screening values are provided in EPA, 2003 or TNRCC, 2001 for aluminum, calcium, iron, magnesium, potassium and sodium. As indicated in Table 1, the following metals were detected at concentrations exceeding their respective ecological screening levels in at least one sample: antimony (one Site sample), barium (four Site samples), chromium (two Site samples), cobalt (one Site sample), lead (five Site samples), manganese (one Site sample), mercury (one Site sample), vanadium (six Site samples and three background samples), and zinc (six Site samples).

Acetone was detected in one background sample as well as the duplicate sample (Table 2). 2-Butanone was detected in the re-analysis of the duplicate background sample and methylene chloride was detected in all samples at low levels, ranging from 0.005 to 0.009 mg/kg. There are no EPA or TCEQ ecological screening values (EPA, 2003 and TNRCC, 2001) for soil for these compounds. These compounds are common laboratory contaminants (EPA, 1999), although their presence was not noted in blank analysis.

Several Site soil samples contained detectable concentrations of one or more SVOCs, primarily polyaromatic hydrocarbons (PAHs) (Table 3). Most of the SVOCs lack EPA or TCEQ ecological screening criteria for soil (EPA, 2003 and TNRCC, 2001). Dieldrin was the only SVOC reported at a concentration exceeding its screening level.

2.2.2 Sediment

Per direction from EPA during previous technical discussions, sediment screening criteria were set at TCEQ screening-level benchmarks (TNRCC, 2001 and subsequent updates). Additionally, these criteria were compared with EPA's sediment ecological toxicity thresholds (SETTs) (EPA, 1996), which were similar if not the same value for all compounds evaluated. The screening levels are generally based on no observable adverse effects levels for long-term exposures as required in Paragraph 37 d (ii) of the SOW attached to the UAO. Analytical data for the sediment samples collected from the on-site ponds were compared to sediment criteria for marine settings because the surface water in the area is brackish and is tidally influenced. Site-specific data will be collected as part of the RI/FS to determine whether sediment in these areas should be considered marine or freshwater.

Four on-site sediment samples were collected at various locations in the Intracoastal Waterway adjacent to the Site. TNRCC also collected four samples (including one duplicate) that it characterized as background samples and five samples that it characterized as off-site samples. These samples were analyzed for metals, VOCs, and SVOCs. In addition, four sediment samples were collected from the ponds and analyzed for metals, VOCs, and SVOCs, with one duplicate analysis. Figures 2 and 4 provide sediment sampling locations.

With regard to metals concentrations (Table 4), the zinc concentration in Site samples SE-8 and SE-10 exceeded the screening criteria (150 mg/kg). The screening criteria for copper (34 mg/kg) was exceeded in one off-site sample (37.4 mg/kg), the screening criteria for arsenic (8.2 mg/kg) was exceeded in one sediment pond sample (9.8 mg/kg), and the screening criteria for nickel (21 mg/kg) was exceeded in two background samples (22.2 mg/kg in SE-5 and 25.3 mg/kg in SE-15). It should be noted that there are no sediment screening-level benchmarks or SETTs (TNRCC, 2001 and EPA, 1996) for aluminum, barium, beryllium, calcium, cobalt, iron, magnesium, manganese, potassium, sodium, or vanadium.

Acetone, carbon disulfide, methylene chloride, and toluene were detected in at least one on-site and off-site sediment sample at very low levels (Table 5). No detected concentrations exceed their respective screening levels although EPA and TCEQ do not have an ecological screening level for carbon disulfide in sediment (TNRCC, 2001 and EPA, 1996). It was noted that acetone was also measured in the method/field blank.

Two sediment samples collected from the Intracoastal Waterway (SE-8 and SE-9) contained several SVOCs, primarily PAHs, reported above their respective detection limit (Table 6). Several PAHs were reported above the ecological screening levels in SE-8 while phenanthrene was the only PAH in sample SE-9 that exceeded its individual screening level. TCEQ has also developed sediment screening levels for low molecular weight PAHs (0.552 mg/kg), high molecular weight PAHs (1.7 mg/kg), and total PAHs (4.022 mg/kg). The low molecular weight PAH, high molecular weight PAH and total PAH concentrations in the SE-8 and SE-9 samples exceeded these screening criteria.

It should be noted that the quantitation limits for many of the samples were higher than the screening criteria for many of the samples although J flagged (i.e., estimated) concentrations below the quantitation limits were reported by the laboratory and used in this evaluation. Bis (2-ethylhexyl) phthalate (BEHP), a common laboratory contaminant, was detected in almost every sample; it was reported in three on-site sediment samples and two off-site sediment samples in excess of their ecological screening criteria. Gamma-chlordane and Aroclor-1254 were measured in excess of the screening level in one on-site sediment sample (It should be noted that in the absence of an available Arochlor-1254 screening level, the overall PCB screening level was used for this analyte). There are no sediment screening-level benchmarks or EPA SETTs for benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, carbazole, heptachlor epoxide, and indeno(1,2,3-cd)pyrene.

2.2.3 Surface Water and Groundwater

One surface water sample was collected from each of the two ponds north of Marlin Avenue (Table 7). The samples were analyzed for VOCs; no compounds were measured in excess of their detection limits, and except for hexachlorobutadiene, all reported detection limits were less than ecological screening criteria (where available).

Groundwater samples were collected from 17 locations on the Site (Figure 2). TNRCC also collected two groundwater samples that it characterized as background samples. Groundwater samples were analyzed for metals (Table 8), VOCs (Table 9) and SVOCs (Table 10). Copper concentrations in almost all Site samples and in both background samples exceeded ecological screening levels. As indicated in Table 8, lead, nickel and zinc concentrations in a number of Site samples and background sample GW-11 also exceeded screening levels. Elevated concentrations

of several VOCs were detected in groundwater in the vicinity of the former surface impoundments (samples GW-1 through GW-5 in Table 9). Benzene; 1,2-dichloroethane (1,2-DCA); 1,1-dichloroethene (1,1-DCE); methylene chloride; tetrachloroethene (PCE); 1,1,1-trichloroethane (1,1,1-TCA); and trichloroethene (TCE) were reported at concentrations above ecological screening criteria in one or more of these samples. A number of SVOCs (see Table 10) were also reported at concentrations exceeding ecological screening levels in one or more of the groundwater samples collected in the vicinity of the former surface impoundments. Groundwater discharge to surface water and wetlands is a potential ecological concern and these pathways will be evaluated further in the RI/FS.

2.3 IDENTIFICATION OF PRELIMINARY COPECS

Tables 1 through 10 provide data for all samples in which a compound was detected in at least one sample for that media. Screening levels were selected based on EPA Guidance (EPA, 2003 and EPA, 1996) and TCEQ Guidance (TNRCC 2001) and subsequent updates. For compounds with screening criteria from both EPA and TCEQ, the EPA value was used preferentially and only when an EPA value was not available from the abovementioned references was the TCEQ value used.

Although existing data are compared to these screening levels in Tables 1 through 10 and in the discussion in Section 2.2 above, no compounds are proposed to be screened out as COPECs based on these limited data. Consistent with EPA guidance (EPA, 2000), it is proposed that the essential nutrients calcium, magnesium, potassium, and sodium be eliminated from consideration as COPECs These are the only compounds that are proposed for screening from the COPEC list in this SLERA.

2.4 POTENTIALLY COMPLETE EXPOSURE PATHWAYS AND PRELIMINARY CONCEPTUAL SITE MODEL

Identification of potentially complete exposure pathways is used to evaluate the exposure potential as well as the risk of direct effects on ecosystem components. In order for an exposure pathway to be considered complete, it must meet all of the following four criteria (EPA, 1997):

- A source of the contaminant must be present or must have been present in the past.

- A mechanism for transport of the contaminant from the source must be present.
- A potential point of contact between the receptor and the contaminant must be available.
- A route of exposure from the contact point to the receptor must be present.

Exposure pathways can only be considered complete if all of these criteria are met. If one or more of the criteria are not met, there is no mechanism for exposure of the receptor to the contaminant. Potentially complete pathways used in the SLERA are shown in Figures 5 and 6 for the terrestrial and estuarine ecosystems, respectively.

It is unclear whether the soil sample SO-6 contains site-related contaminants or the presence of PAHs in that sample is related to its close proximity to Marlin Avenue. Historical evidence suggests that releases from the impoundments may have occurred, prior to their closure, as well as direct discharge of wastes into the Intracoastal Waterway during barge cleaning.

Contaminants from Site operations and the impoundments could have migrated and possibly continue to migrate with surface runoff and volatilization/particulate dust generation and subsequent deposition. Direct discharges from past operations to soil or surface water at the Site may have impacted these media as well as sediments. Contaminants from Site operations and the impoundments could have also possibly migrated to groundwater and then with groundwater to surface water and/or wetlands.

In general, biota can be exposed to chemical stressors through direct exposure to abiotic media, or through ingestion of forage or prey that have accumulated contaminants. Exposure routes are the mechanisms by which a chemical may enter a receptor's body. Possible exposure routes include 1) absorption across external body surfaces such as cell membranes, skin, integument, or cuticle from the air, soil, water, or sediment; and 2) ingestion of food and incidental ingestion of soil, sediment, or water along with food. Absorption is especially important for microbes, plants, and aquatic animals.

2.5 THREATENED AND ENDANGERED SPECIES

The US Fish and Wildlife Service (USFWS) was consulted (USFWS, 2005b) and information obtained from the USFWS and Texas Parks and Wildlife Department (TPWD) regarding Threatened and Endangered Species. According to USFWS (USFWS, 2005c), Threatened and

Endangered Species for Brazoria County include: bald eagle (*Haliaeetus leucocephalus*), brown pelican (*Pelecanus occidentalis*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricate*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), piping plover (*Circus melodus*), and whooping crane (*Grus americana*). According to TPWD (TPWD, 2005), Threatened and Endangered Species for Brazoria County include: bald eagle (*Haliaeetus leucocephalus*), black rail (*Laterallus jamaicensis*), eastern brown pelican (*Pelecanus occidentalis occidentalis*), interior least tern (*Sterna antillarum athalassos*), piping plover (*Circus melodus*), reddish egret (*Falco rufescens*), swallow-tailed kite (*Elanoides forficatus*), white-faced ibis (*Plegadis chihi*), wood stork (*Mycteria Americana*), and corkwood (*Leitneria floridana*) (TPWD, 2005). None of these species have been noted at the Site but they are known to live in or on, feed in or on, or migrate through the Texas Gulf Coast and estuarine wetlands.

2.6 ASSESSMENT AND MEASUREMENT ENDPOINTS

Assessment endpoints are explicit expressions of the ecological resource to be protected (EPA, 1997). Identification of assessment endpoints is necessary to focus the SLERA on more sensitive and ecologically relevant receptors rather than attempting to evaluate risks to all potentially affected ecological receptors. Assessment and measurement endpoints are discussed in relation to the risk question and testable hypotheses for each habitat and receptor group in Tables 11 and 12 (terrestrial and estuarine wetland/aquatic, respectively).

2.6.1 Terrestrial Assessment Endpoints

The terrestrial habitat associated with the Site includes a small area of land adjacent Marlin Avenue and near the former impoundments as well as the area south of Marlin Avenue. Biota serves as a food source for food chain receptors. The environmental value for this area is related to its ability to support plant communities, soil microbes/detritivores and wildlife. As indicated on Figure 5 and described in Table 11, the assessment endpoints for this area include:

- Vegetation survival, growth, and reproduction are values to be preserved in the terrestrial ecosystem. As food, plants provide an important pathway for energy and nutrient transfer from the soil to herbivores and omnivores as well as invertebrates. Plants also provide critical habitat for terrestrial animals.

- Detritivore survival, growth, and reproduction and function (as a decomposer) are ecological values to be preserved in a terrestrial ecosystem because they provide a mechanism for the physical breakdown of detritus for microbial decomposition (remineralization), which is a vital function.
- Mammalian and avian herbivore and omnivore survival, growth, and reproduction are ecological values to be preserved in a terrestrial ecosystem because they are critical components of local food webs in most habitat types. In addition, small mammal and avian receptors can be important in the dispersal of seeds and the control of insect populations.
- Mammalian, reptilian, and avian carnivore survival, growth, and reproduction are values to be preserved in the terrestrial ecosystem because they provide food to other carnivores, omnivores, scavengers, and microbial decomposers. They also affect the abundance, reproduction, and recruitment of lower trophic levels, such a vertebrate herbivores and omnivores through predation.

2.6.2 Estuarine Wetland and Aquatic Assessment Endpoints

The estuarine wetland habitat for the Site extends over the majority of the area north of Marlin Avenue while the Intracoastal Waterway (i.e., aquatic habitat) is south of the Site. Wetlands are particularly important habitat because they act to filter water prior to it going into another water body, they are important nurseries for fish, crab, and shrimp, and they act as natural detention areas to prevent flooding. The environmental value for these areas is related to its ability to support wetland plant communities, microbes/benthos/detritivores and wildlife. As indicated in Figure 6 and described in Table 12, the assessment endpoints for these areas include:

- Wetland vegetation survival, growth, and reproduction are values to be preserved in the estuarine wetland ecosystem. As food, plants provide an important pathway for energy and nutrient transfer from the soil to herbivores and omnivores as well as invertebrates. Plants also provide critical habitat for vertebrates and invertebrates.
- Benthos survival, growth, and reproduction are values to be preserved in estuarine ecosystems because these organisms provide a critical pathway for energy transfer from detritus and attached algae to other omnivorous organisms (e.g., polychaetes and crabs) and carnivorous organisms (e.g., black drum and sandpipers), as well as integrating and transferring the energy and nutrients from lower trophic levels to higher trophic levels.

The most important service provided by benthic detritivores is the physical breakdown of organic detritus to facilitate microbial decomposition.

- Zooplankton survival, growth, and reproduction are values to be preserved in estuarine ecosystems. Zooplankton provide a food source for energy transfer through the water column-based pathway from phytoplankton to filter feeding and planktivorous organisms (e.g., finfish, shrimp, clams, worms, and oysters).
- Herbivorous and omnivorous fish and shellfish survival, growth, and reproduction are values to be preserved in estuarine ecosystems because they are critical components of the food web.
- Vertebrate carnivore (i.e., fish, fish-eating, and invertebrate-eating birds) survival, growth, and reproduction are values to be preserved in estuarine ecosystems. Vertebrates provide food for other carnivores and omnivores and affect species composition, recruitment, and abundance of lower trophic level organisms.

Given that the Intracoastal Waterway is a deep, high-energy environment (i.e., dredged regularly) and light penetration is poor due to the high turbidity, submerged aquatic vegetation is not likely to thrive in this area and, as such, is not an ecological resource to be protected as part of this assessment.

2.6.3 Measurement Endpoints

The measurement endpoints for the Site and the Intracoastal Waterway are the measurements of spatial distribution of chemical concentrations in soil and sediment to assess exposure concentrations for potentially exposed receptors. Maximum concentrations of chemicals measured in environmental media will be compared to appropriate ecological benchmarks for the purposes of the SLERA. Tables 1 through 10 provide the data that will serve as the measurement endpoints until additional data are collected. Tables 11 and 12 provide additional discussion related to measurement endpoints for terrestrial and estuarine wetland/aquatic habitats, respectively, in the SLERA.

3.0 SCREENING-LEVEL EXPOSURE ANALYSIS

The screening-level exposure and risk calculation description presented in this section of the SLERA corresponds to Step 2 of EPA guidance (EPA, 1997). Step 2 includes an assessment of potential ecotoxicity of stressors and the result of Step 2 is a decision on whether additional ecological risk evaluation is necessary and/or if data gaps exist.

The SLERA compares site-related concentrations to receptor- and chemical-specific risk-based screening criteria when available. The risk-based screening levels used for the SLERA represent concentrations that are associated with exposures that would be very likely to show no toxicity to the ecological receptors inhabiting the Site.

3.1 POTENTIAL RECEPTORS

Several representative groups of wildlife were identified as receptors of concern (ROCs) for use in the SLERA. Each group of receptors represents a group of species (feeding guild) with similar habitat use and feeding habits that could potentially inhabit either the terrestrial, estuarine wetland, or aquatic habitats at the Site. Representative species groups that may use the habitats at the Site are described briefly below. When several species may be present that could represent the feeding guild for a habitat, the species was chosen as the ROC for that feeding guild based on its habitat affinity and potential for exposure.

3.1.1 Terrestrial Receptors

- Detritivores, Invertebrates and Terrestrial Plants. There are limited terrestrial areas at the Site. The earthworm was chosen to represent detritivores and invertebrates for the terrestrial ecosystem in this area because it is a sensitive organism toxicologically and an important part of the food chain as prey for some first-order carnivores.

- Mammalian Herbivores and Omnivores. Habitat type plays a major role in the presence and abundance of the various species of mammals found at the Site. Of the three major groups of mammalian receptors (predators, ungulates, and rodents) potentially found at the Site, the small mammalian rodents are the most diverse and complex, and are most likely to have the highest area use factor. The habitat most likely does not support an

ungulate population because it does not provide protective cover that they prefer although they may graze on some of the terrestrial plants on occasion. The omnivorous deer mouse (*Peromyscus maniculatus*) was selected as the ROC for the various feeding guilds of small mammals at the Site. Dietary composition for the deer mouse, with an assumed area use factor of 100 percent, is assumed to be an equal mix of terrestrial invertebrates and terrestrial plant tissue in order to assess the potential exposures to a receptor ingesting a general mix of prey types at the Site.

- Mammalian Predators. Carnivores potentially present include omnivores such as the spotted and striped skunks and raccoon as well as the coyote (*Canis latrans*). Fecal evidence of a predator species was observed at the Site. Since some of the COPECs are considered bioaccumulative compounds, assessing risks to an upper trophic level receptor is advisable. Therefore, the coyote (*Canis latrans*) was selected as the ROC for the mammalian carnivore feeding guild as it may feed at the Site on occasion as part of its larger home range. An area use factor of 100 percent was conservatively assumed per EPA, 1997.

- Reptilian Predators. A representative reptilian predator for the Site is the rat snake (*Elaphe obsolete*), which has been observed at the Site. Rat snakes feed primarily on small mammals and eggs. An area use factor of 100 percent was conservatively assumed per EPA, 1997.

- Avian Herbivores and Omnivores. In general, avian species are influenced by the same types of landscape components as mammals, although vegetation is by far the more important factor. Birds are generally less important than mammals in terrestrial risk assessments because they live in less intimate contact with the soil, are highly mobile, and in many cases are present only seasonally. Most small birds have flexible diets that emphasize specific types of plant or animal material during certain seasons and most species are somewhat opportunistic, feeding on whatever food source is most abundant or particularly nutritious/palatable at a given time. A generalized avian receptor, represented by the American robin (*Turdus migratorius*), was selected to represent the omnivorous feeding guild. An area use factor of 100 percent was conservatively assumed per EPA, 1997.

- Avian Predators. Representative avian predators (raptors) for the Site include the red-tailed hawk (*Buteo jamaicensis*) although it has not been observed at the Site. It, however, may use the Site for hunting prey occasionally. They feed primarily on small rodents, snakes, and lizards although they are opportunistic and will feed on other prey at times. An area use factor of 100 percent was conservatively assumed per EPA, 1997.

3.1.2 Estuarine Wetland and Aquatic Receptors

- Benthos, Zooplankton, and Wetlands Plants. Polychaetes burrow in and ingest sediment and have a greater exposure potential to sediment-bound chemicals that most epibenthos such as shrimp and crab. Polychaetes are likely to be the most abundant class of benthic organisms found in the Intracoastal Waterway and, as such, *Capitella capitata* was chosen to represent this receptor class.

- Fish and Shellfish. Fiddler crabs (*Uca rapax*) and killifish (*Fundulus grandis*) were chosen to represent herbivorous or omnivorous species in the estuarine wetland and aquatic ecosystems, respectively. Fiddler crabs and their burrows are abundant at the Site. They eat detritus (dead or decomposing plant and animal matter) and serve as a food source for many wetland animals. It was assumed that their area use factor is 100 percent. The killifish was chosen to represent this feeding guild because it is likely to be present in the area of the Site and because it is an omnivorous fish that feeds primarily on organic detritus, small crustaceans, zooplankton, epiphytic algae, and polychaetes. Killifish may inhabit the Site for its entire life cycle; therefore, an area use factor of 100 percent was assumed.

- Carnivorous Fish. Black drum (*Pogonias cranius*) was selected as the first order carnivore ROC because it is present in the Intracoastal Waterway and because it is an omnivorous carnivore that eats shrimp, crabs, small fish, benthic worms and algae. Per EPA, 1997, an area use factor of 100 percent was conservatively assumed.. The spotted seatrout (*Cynoscion nebulosus*) was chosen to represent a second order carnivorous fish species because it is present in the Intracoastal Waterway and because adult fish feed almost exclusively on other fish. It was conservatively assumed that the area use factor for the spotted seatrout is 100 percent per EPA, 1997.

- Avian Predators. Sandpipers (*Calidris genus*) were chosen as first order avian predator ROC because they have been observed at the Site. Although not observed at the Site, the green heron (*Butorides striatus*) was chosen as the second order avian predator ROC to assess food chain impacts. Sandpipers are migratory birds that feed on aquatic insects and larva, marine worms, small crabs, small mollusks, and other invertebrate prey items. An area use factor of 100 percent was conservatively assumed per EPA, 1997. Green herons are migratory birds that feed on small fish invertebrates, insects, frogs, and other small animals. Per EPA, 1997, an area use factor of 100 percent was conservatively assumed for green herons as well.

3.2 SCREENING-LEVEL EXPOSURE ESTIMATES

In the exposure analysis, potential exposure of ecological receptors to COPECs is quantified. There are two basic routes of exposure for the COPECs and receptors at the Site: 1) ingestion both from food and soil/sediment; and 2) direct contact. Quantification of exposure potential for both of these exposure routes requires data on chemical concentrations in environmental media (e.g., soil, sediment, prey items) and ingestion rates or contact information for each receptor and pathway. In addition, body weights, home range size, and other factors must be known for each of the receptors, as well as the chemical and physical properties of the COPECs. Ecological receptors based on an ingestion pathway include birds, crustaceans, mammals, and fish. Receptors evaluated based on direct contact, include earthworms in the terrestrial ecosystem and polychaetes and amphipods in the wetlands/aquatic ecosystem.

Exposures via inhalation or dermal absorption were not evaluated for most receptors because of a lack of appropriate exposure and toxicity data and the uncertainty associated with these pathways. The exposure of animals to contaminants in soil by dermal contact is likely to be small due to barriers of fur, feathers, and epidermis. Therefore, the SLERA focuses on the ingestion pathways as the primary exposure route for most vertebrates (unless direct contact is specifically noted and assessed).

For most receptors evaluated based on ingestion, exposure is quantified by estimating the daily dose (mg COPEC/kg body weight per day) that the receptor is expected to receive. For second order carnivorous fish, mammals, and birds exposed through ingestion, estimates of exposure are calculated using dietary concentration rather than daily dose. For the direct contact pathway (i.e.,

earthworm and polychaetes, the COPEC concentration in soil or sediment was used directly to estimate exposure.

At this time, sufficient information is not available to estimate a reliable exposure point concentration in soil or sediment to adequately characterize exposure and subsequent risk. Therefore, the remainder of this section will describe the process that will be followed once additional data are available (i.e., after additional soil and sediment samples are collected during the RI) to estimate exposure. The comparison to screening levels in Section 2 provides a very conservative evaluation that generally predicts potential effects from direct contact exposure.

The general equation that will be used for estimating COPEC dose from the soil/sediment and food ingestion pathways is presented below:

For a soil and sediment pathway:

$$Dose_{soil/sediment} = \frac{C_{soil/sediment} \times IR_{soil/sediment} \times AF_{soil/sediment} \times AUF}{BW}$$

For a food (dose) pathway:

$$Dose_{food} = \frac{C_{food} \times IR_{food} \times AUF}{BW}$$

Where:

$C_{soil/sediment}$	=	chemical concentration in soil/sediment (mg/kg)
C_{food}	=	chemical concentration in food (mg/kg)
$IR_{soil/sediment}$	=	soil ingestion rate (kg/day)
IR_{food}	=	food ingestion rate (kg/day)
$AF_{soil/sediment}$	=	chemical bioavailability factor from soil (unitless)
AUF	=	area-use factor (unitless)
BW	=	wildlife receptor body weight (kg)

COPEC concentrations in food will be estimated from soil/sediment concentrations using bioaccumulation factors (BAFs) or biota-sediment accumulation factors (BSAFs) with the following equation:

$$C_{food} = C_{soil/sediment} \times BAF \text{ (or BSAF if sediment)}$$

For those receptors exposure through both soil/sediment and dietary exposure routes, the dose will be assumed to be additive with the equation:

$$Dose_{total} = Dose_{soil/sediment} + Dose_{food}$$

Various literature sources, including the Wildlife Exposure Factors Handbook (EPA, 1993), will be reviewed to determine the types of prey ingested by the wildlife receptors and the amounts. It is assumed that the deer mouse has incidental soil ingestion only, while the coyote and the red-tailed hawk predominantly have food ingestion with an incidental amount (i.e., 2%) of soil ingestion, and the American robin and rat snake are exposed through both food and soil sources. It is assumed that fiddler crabs, killifish, sandpipers, and black drum are exposed to COPECs via food and incidental ingestion of sediment while spotted seatrout, and green heron are exposed via prey items and incidental (2%) sediment ingestion.

For the conservative purposes of this initial assessment, the exposure point concentration for soil, sediment, and/or prey items will generally be based on a maximum concentration, per EPA, 1997.

4.0 SCREENING-LEVEL ECOLOGICAL RISK CHARACTERIZATION

Ecological risk characterization of the risk assessment process is typically conducted by comparing estimates of site exposure to site-related chemicals to toxicity reference values (TRVs), which represent the threshold for exposure above which adverse ecological effects may be seen. The COPEC screening that was conducted in Section 2 was chemical-specific but not species-specific and is assumed to be a worst-case analysis.

4.1 TOXICITY REFERENCE VALUES

Species-specific TRVs will be determined using scientific literature and other resources available and the selected benchmarks will generally be based on measurements of survival growth or reproduction in the laboratory.

A TRV will be selected from the available scientific literature for each compound using the following criteria:

- Doses based on the receptor species selected for evaluation will be used preferentially; however, if toxicity information is not available for the species, doses for animals within the same class as the receptor species will be used.
- Data for reproductive or developmental effects will be used preferentially over other endpoints. Reproductive and developmental effects represent a more sensitive measure of wildlife effects than mortality. Therefore, these effects will be chosen in preference to the less sensitive mortality endpoint for assessing ecological risk to the ROCs.
- Chronic data will be used preferentially to sub chronic or acute data, and no observable adverse effects levels (NOAELs) will be used in preference to lowest observable adverse effects levels (LOAELs) and effects measurements.

TRVs may not be available for each receptor class or for each compound and no inter-class extrapolations will be conducted due to the inherent uncertainty involved. Where appropriate, surrogate values may be used, however, in intra-class extrapolations for chemicals without TRVs. Because using surrogate values introduces considerable uncertainty into the risk assessment process, care will be taken to only use surrogate values for chemicals with similar chemical

structures or toxicities to minimize the uncertainty. The chemicals with no TRVs will be discussed in the uncertainty section.

4.2 SCREENING-LEVEL RISK ESTIMATES

In this section, the dose estimate is compared to the TRV to evaluate the potential for adverse health effects to the ROC. Hazard quotients (HQs) are calculated to make these comparisons. The HQ is a ration of the estimated exposure concentration to the TRV where:

$$HQ = Dose / TRV$$

If the HQ is less than 1, indicating the exposure concentration or dose is less than the TRV, adverse effects are considered highly unlikely. If the HQ is equal to or greater than 1, a potential for adverse effects may exist. It should be noted that an HQ greater than one by itself does not indicate the magnitude or effect nor does it provide a measure of potential population-level effects (Menzie et al., 1992). Because of this issue, HQs will be calculated using NOAELs and LOAELs to provide a range of results to assist with risk management decisions. In general, NOAEL-based results are generally considered to be applicable to individual level effects while LOAEL-based results may be more consistent with potential effects to the population-level of ecological organization.

5.0 SUMMARY AND CONCLUSIONS OF THE SLERA

The SLERA can be used to assess the need and, if required, the level of effort required to conduct a baseline ecological risk assessment. Furthermore, the SLERA can be used to focus subsequent phases of the investigation by eliminating compounds from further evaluation (EPA, 2001).

5.1 SUMMARY OF RISK EVALUATION

Results of the SLERA cannot rule out the potential for adverse effects to receptors utilizing the ecological habitats at the Site. Based on this conservative screening level evaluation, risk to terrestrial receptors may occur due to barium, chromium, cobalt, lead, manganese, zinc, PAHs, and specific pesticides in soil. Risk to estuarine wetland and aquatic receptors may occur due to arsenic, barium, lead, zinc, PAHs, specific pesticides, and PCBs in sediment. It should be cautioned that this conservative and preliminary evaluation is based on limited existing data and does not indicate that a threat actually exists but rather suggests that further evaluation is necessary. It is, therefore, recommended that additional soil, sediment, surface water, and groundwater data be collected in these areas to better characterize the nature and extent of contamination and potential risks. It is also recommended that based on the preliminary nature of this evaluation, that the SLERA be re-visited once additional data are available.

Calcium, magnesium, potassium, and sodium were screened out from further ecological risk evaluation due to their general lack of toxicity (EPA, 2001) and identification as essential nutrients (EPA, 2000). Therefore, consistent with the UAO and EPA guidance (2001), it is recommended that these compounds in soil, sediment, surface water and groundwater be screened out from further consideration in the ecological risk assessment process.

5.2 SELECTION OF COPECS FOR FURTHER EVALUATION

Identification of COPECs for the baseline ecological risk assessment (BERA) was one of the primary objectives of the SLERA and was based primarily on exceedances of risk-based criteria by maximum soil and sediment concentrations. The COPECs proposed for inclusion in the re-evaluated SLERA (to be performed after completion of additional soil and sediment data during the RI) and possibly the BERA are:

- VOCs (as listed in the Final Quality Assurance Project Plan (PBW, 2005);
- SVOCs (as listed in PBW, 2005);
- PCBs;
- Organochlorine Pesticides (as listed in PBW, 2005); and
- Metals (as listed in PBW, 2005, except for calcium, magnesium, potassium and sodium).

5.3 UNCERTAINTY

Uncertainty is inherent in each step of the risk assessment process. The general approach of the SLERA has been to error on the side of conservatism and, as such, this SLERA is more likely to overestimate risk rather than underestimate it. EPA (EPA, 2001) stresses that the SLERA is not intended to be a definitive estimate of risk but that it can provide a high level of confidence in determining a low probability of adverse risk, and that it incorporates uncertainty in a precautionary manner.

Uncertainty related to this evaluation is mostly associated with the lack of preliminary screening levels for many of the compounds measured at low levels at the Site. Generally, screening levels have been developed for the more toxic compounds and many without criteria are essential nutrients such as calcium and potassium. After additional soil and sediment data are collected and analyzed, chemical- and species-specific screening levels will be developed.

Since point-by-point comparisons were made using conservative screening limits for compounds with screening limits, it is likely that the evaluation is very conservative and true risks are much less. However, it should be cautioned that some of the detection limits, especially for the PAHs, were higher than available levels when available. Therefore, it is recommended that soils, sediments, surface water and groundwater are collected and analyzed for PAHs at appropriately low detection limits.

5.4 SCIENTIFIC MANAGEMENT DECISION POINT

The SLERA concludes with a SMDP, which indicates if additional ecological evaluation is necessary. Based on the SLERA, additional data are recommended to better characterize the nature and extent of contamination and potential risks associated with the Site. Additional data,

however, are not necessary for ecological risk purposes for the following compounds: calcium, magnesium, potassium, and sodium.

As discussed at the August 4, 2005 Scoping Meeting, the SLERA and this SMDP will be re-evaluated after a more complete database of environmental samples collected during the RI has been developed.

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TABLES

TABLE 1 - SUMMARY OF METALS CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Aluminum (mg/Kg)	Antimony (mg/Kg)	Arsenic (mg/Kg)	Barium (mg/Kg)	Beryllium (mg/Kg)	Cadmium (mg/Kg)	Calcium (mg/Kg)	Chromium (mg/Kg)	Cobalt (mg/Kg)	Copper (mg/Kg)	Iron (mg/Kg)	Lead (mg/Kg)
SITE SAMPLES														
SO-6	25-Jan-00	0-0.5	2,360	<0.83 Jv[3,4]	2.7	159	0.13 L[1]	<0.25	6,720 J	21.6 J	3.0 L	47.8	20,800	221 J
SO-7	25-Jan-00	0-0.5	26,600	<1.1 Jv	6.3	247	1.3 L	<0.32	22,100 J	27.6 J	13.1 L	32.0	26,500	22.7 J
SO-8	25-Jan-00	0-0.5	6,520	<0.90 Jv	2.1	105	0.34 L	<0.27	29,100 J	17.1 J	3.4 L	11.2	8,110	46.4 J
SS3	18-Mar-99	0-0.5	NA[2]	NA	1.99	133	<0.99	<0.99	NA	5.17	NA	NA	NA	54.3
SS4	18-Mar-99	0-0.5	NA	NA	2.19	95.4	<1.0	<1.0	NA	8.76	NA	NA	NA	48.6
SO-1	25-Jan-00	0-0.5	4,530	<0.77 R[5]	1.9 L	269	0.50 L	<0.23	5,020	13.5	3.0 L	10.7	15,900	17.3
SO-2	25-Jan-00	0-0.5	9,090	<0.78 R	1.5 L	271	0.65 L	<0.23	8,490	14.9	3.1 L	23.5	15,200	11.9
SO-3	25-Jan-00	0-0.5	10,900	1.5 Jv	3.8	266	0.53 L	<0.25	63,400	14.8	4.8 L	13.1	13,500	18.5
SO-4	25-Jan-00	0-0.5	6,900	<0.85 R	2.6	510	0.37 L	<0.25	49,000	18.7	3.4 L	40.2	12,400	79
SO-5	25-Jan-00	0-0.5	7,870	<0.81 Jv	3.6	371	0.39 L	<0.24	33,800 J	24 J	4.5 L	21.8	13,800	65.7 J
B1-0-6"	17-Mar-99	0-0.5	NA	NA	6.05	112	<0.98	<0.98	NA	34.0	NA	NA	NA	130
B2-0-6"	17-Mar-99	0-0.5	NA	NA	1.57	390	<0.98	<0.98	NA	14.9	NA	NA	NA	43.3
B2-3'	17-Mar-99	3-3.5 (est.)	NA	NA	1.75	429	<0.97	<0.97	NA	15.0	NA	NA	NA	46.8
Dry Dock	22-Feb-99	Grab (surf.)	NA	NA	NA	NA	0.140	NA	NA	NA	NA	NA	NA	NA
BACKGROUND SAMPLES														
SO-9	25-Jan-00	0-0.5	13,800	<0.94 Jv	3.1	223	0.68 L	<0.28	18,300 J	14.6 J	5.8 L	12.6	15,500	14.3 J
SO-10	25-Jan-00	0-0.5	25,300	<0.96 Jv	4.9	180	1.1 L	<0.29	34,200 J	25.0 J	8.8 L	18.3	21,700	13.3 J
SO-11	25-Jan-00	0-0.5	12,500	<0.96 Jv	3.8	147	0.62 L	<0.28	32,300 J	14.0 J	6.0 L	30.0	13,300	12.9 J
Screening Level			None	0.27[6]	18+[6]	330++[6]	21[6]	0.36[6]	None	26+++[6]	13+[6]	61*[7]	None	50[7]

TABLE 1 - SUMMARY OF METALS CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Magnesium (mg/Kg)	Manganese (mg/Kg)	Mercury (mg/Kg)	Nickel (mg/Kg)	Potassium (mg/Kg)	Selenium (mg/Kg)	Silver (mg/Kg)	Sodium (mg/Kg)	Vanadium (mg/Kg)	Zinc (mg/Kg)
SITE SAMPLES												
SO-6	25-Jan-00	0-0.5	1,580	194	<0.06	11.4	770 L	<0.58	<0.42	1,130	6.6 L	431 J
SO-7	25-Jan-00	0-0.5	13,700	962	<0.07	26.3	7,460	<0.74	<0.54	1,680	41	86.2 J
SO-8	25-Jan-00	0-0.5	4,630	168	<0.06	8.2 L	1,800	<0.63	<0.46	1,080 L	13	92.9 J
SS3	18-Mar-99	0-0.5	NA	NA	<0.1	NA	NA	<0.99	<0.99	NA	NA	NA
SS4	18-Mar-99	0-0.5	NA	NA	<0.1	NA	NA	<1.0	<1.0	NA	NA	NA
SO-1	25-Jan-00	0-0.5	984 L	85.6 Jv	<0.05	10.1	820 L	<0.54	<0.39	861 L	8.0 L	368
SO-2	25-Jan-00	0-0.5	1,480	90.3 Jv	<0.05	10.6	1,040 L	<0.55	<0.4	473 L	15.9	1,150
SO-3	25-Jan-00	0-0.5	6,110	265 Jv	<0.06	11.9	3,130	<0.6	<0.6	1,040 L	18.2	124
SO-4	25-Jan-00	0-0.5	3,690	207 Jv	<0.06	9.1 L	2,470	<0.6	<0.6	1,230	14.6	580
SO-5	25-Jan-00	0-0.5	5,080	292	<0.06	11.1	2,400	<0.57	<0.42	1,590	15.7	416 J
B1-0-6"	17-Mar-99	0-0.5	NA	NA	0.16	NA	NA	<0.98	<0.98	NA	NA	NA
B2-0-6"	17-Mar-99	0-0.5	NA	NA	<0.1	NA	NA	<0.98	<0.98	NA	NA	NA
B2-3'	17-Mar-99	3-3.5 (est.)	NA	NA	<0.1	NA	NA	<0.97	<0.97	NA	NA	NA
Dry Dock	22-Feb-99	Grab (surf.)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BACKGROUND SAMPLES												
SO-9	25-Jan-00	0-0.5	7,750	224	<0.07	13.1	4,260	<0.66	<0.48	1,270	20.4	50.1 J
SO-10	25-Jan-00	0-0.5	14,900	512	<0.06	20.7	7,250	<0.68	<0.49	10,200	35.4	49.2 J
SO-11	25-Jan-00	0-0.5	10,500	381	<0.07	13.7	4,060	<0.67	<0.49	8,960	21.3	42.2 J
Screening Level			None	500[7]	0.1*[7]	30[7]	None	1[7]	2[7]	None	7.8+++[8]	120*[7]

Notes:

1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = Not analyzed.
3. v= Low biased. Actual concentration may be higher than the concentration reported.
4. J= Estimated value.
5. R= Result flagged as unusable by EPA contractor.
6. Samples SO-1 through SO-11 also analyzed for thallium and cyanide (all results were non-detect).
7. From Table 3-4 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas". Values indicated with "*" are based on earthworms. All other values are based on plant exposure.
8. From EPA's "Ecological Soil Screening Level". Values indicated with "+" are based on plants. Values indicated with "++" are based on Soil Invertebrates. Values indicated with "+++" are based on avian wildlife. All other values are based on mammalian wildlife.
9. Shaded values exceed screening level.

TABLE 2 - SUMMARY OF VOC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Acetone (mg/Kg)	2-Butanone (mg/Kg)	Carbon Disulfide (mg/Kg)	Chloroform (mg/Kg)	1,2-Dichloro-ethane (mg/Kg)	Ethylbenzene (mg/Kg)	Isopropyl-benzene (mg/Kg)
SITE SAMPLES									
SO-6	25-Jan-00	0-0.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
SO-7	25-Jan-00	0-0.5	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
SO-8	25-Jan-00	0-0.5	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
B7-3'	17-Mar-99	3	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002
B8-3'	17-Mar-99	3	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002
SO-1	25-Jan-00	0-0.5	0.005 LJ	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
SO-2	25-Jan-00	0-0.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
SO-2RE	25-Jan-00	0-0.5	<0.010	<0.010	<0.010	<0.010	0.003 LJ	<0.010Jv	<0.010Jv
SO-3	25-Jan-00	0-0.5	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
SO-4	25-Jan-00	0-0.5	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
SO-5	25-Jan-00	0-0.5	<0.011 Jv [3]	<0.011 Jv	<0.011 Jv	0.002 LJ	<0.011 Jv	<0.011 Jv	<0.011 Jv
SO-5RE	25-Jan-00	0-0.5	0.008	<0.010	<0.010	0.003	<0.010	<0.010	<0.010
B3-3'	17-Mar-99	3	<0.01	<0.01	<0.002	<0.002	0.0024	<0.002	<0.002
B4-3'	17-Mar-99	3	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002
B5-3'	17-Mar-99	3	<0.01	<0.01	<0.002	<0.002	0.002	<0.002	0.007
B10-3'	17-Mar-99	3	<0.01	<0.01	<0.002	<0.002	<0.002	0.0066	0.0026
B14-3'	17-Mar-99	3	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002

TABLE 2 - SUMMARY OF VOC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Methylene Chloride (mg/Kg)	Styrene (mg/Kg)	Trichloro-fluoromethane (mg/Kg)	1,2,4-Tri-methylbenzene (mg/Kg)	Xylenes (mg/Kg)	TPH diesel (mg/Kg)
SITE SAMPLES								
SO-6	25-Jan-00	0-0.5	0.006 LJ[1,4]	<0.010	<0.010	NA[2]	<0.010	NA
SO-7	25-Jan-00	0-0.5	0.008 LJ	<0.014	<0.014	NA	<0.014	NA
SO-8	25-Jan-00	0-0.5	0.005 LJ	<0.012	<0.012	NA	<0.012	NA
B7-3'	17-Mar-99	3	<0.01	<0.002	<0.002	<0.002	<0.002	<10
B8-3'	17-Mar-99	3	<0.01	<0.002	<0.002	<0.002	<0.002	<10
SO-1	25-Jan-00	0-0.5	<0.010	<0.010	<0.010	NA	<0.010	NA
SO-2	25-Jan-00	0-0.5	0.016	<0.010	<0.010	NA	<0.010	NA
SO-2RE	25-Jan-00	0-0.5	0.006 LJ	0.001 LJ	0.002 LJ	NA	<0.010Jv	NA
SO-3	25-Jan-00	0-0.5	0.017	<0.011	<0.011	NA	<0.011	NA
SO-4	25-Jan-00	0-0.5	0.013	<0.012	<0.012	NA	<0.012	NA
SO-5	25-Jan-00	0-0.5	0.025 J	<0.011 Jv	0.002 LJ	NA	<0.011 Jv	NA
SO-5RE	25-Jan-00	0-0.5	0.007	<0.010	<0.010	NA	<0.010	NA
B3-3'	17-Mar-99	3	<0.01	<0.002	<0.002	<0.002	<0.002	23.8
B4-3'	17-Mar-99	3	<0.01	<0.002	<0.002	<0.002	<0.002	11.7
B5-3'	17-Mar-99	3	<0.01	<0.002	<0.002	<0.002	<0.002	61.1
B10-3'	17-Mar-99	3	<0.01	<0.002	<0.002	0.0022	0.0077	792
B14-3'	17-Mar-99	3	<0.01	<0.002	<0.002	<0.002	<0.002	NA

TABLE 2 - SUMMARY OF VOC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Acetone (mg/Kg)	2-Butanone (mg/Kg)	Carbon Disulfide (mg/Kg)	Chloroform (mg/Kg)	1,2-Dichloro-ethane (mg/Kg)	Ethylbenzene (mg/Kg)	Isopropyl-benzene (mg/Kg)
BACKGROUND SAMPLES									
SO-9	25-Jan-00	0-0.5	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
SO-9RE	25-Jan-00	0-0.5	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013Jv	<0.013Jv
SO-10	25-Jan-00	0-0.5	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
SO-10RE	25-Jan-00	0-0.5	0.011 LJ	<0.013 Jv	<0.013 Jv	<0.013 Jv	<0.013 Jv	<0.013 Jv	<0.013 Jv
SO-11	25-Jan-00	0-0.5	<0.012Jv	<0.012 Jv	<0.012 Jv	<0.012 Jv	<0.012 Jv	<0.012 Jv	<0.012 Jv
SO-11RE	25-Jan-00	0-0.5	0.011	0.009	<0.012	<0.012	<0.012	<0.012	<0.012
Screening Level			None	None	None	None	None	None	None

TABLE 2 - SUMMARY OF VOC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Methylene Chloride (mg/Kg)	Styrene (mg/Kg)	Trichloro-fluoromethane (mg/Kg)	1,2,4-Tri-methylbenzene (mg/Kg)	Xylenes (mg/Kg)	TPH diesel (mg/Kg)
BACKGROUND SAMPLES								
SO-9	25-Jan-00	0-0.5	0.008	<0.013	<0.013	NA	<0.013	NA
SO-9RE	25-Jan-00	0-0.5	<0.013	<0.013	<0.013	NA	<0.013Jv	NA
SO-10	25-Jan-00	0-0.5	0.006	<0.012	<0.012	NA	<0.012	NA
SO-10RE	25-Jan-00	0-0.5	<0.013 Jv	<0.013 Jv	<0.013 Jv	NA	<0.013 Jv	NA
SO-11	25-Jan-00	0-0.5	0.006 LJ	<0.012 Jv	<0.012 Jv	NA	<0.012 Jv	NA
SO-11RE	25-Jan-00	0-0.5	0.009	<0.012	<0.012	NA	<0.012	NA
Screening Level			None	200[5]	None	None	None	None

Notes:

1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = Not analyzed.
3. v= Low biased. Actual concentration may be higher than the concentration reported.
4. J= Estimated value.
5. From Table 3-4 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas". Values indicated with "*" are based on earthworms. All other values are based on plant exposure.

TABLE 3 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Acena-phthene (mg/Kg)	Aceto-phenone (mg/Kg)	Anthracene (mg/Kg)	Aroclor 1254 (mg/Kg)	Benzaldehyde (mg/Kg)	Benzo(a) anthracene (mg/Kg)	Benzo (b) fluoranthene (mg/Kg)	Benzo(k) fluoranthene (mg/Kg)	Benzo(a) pyrene (mg/Kg)	Benzo(g,h,i) perylene (mg/Kg)	beta-BHC (mg/Kg)
SITE SAMPLES													
SO-6	25-Jan-00	0-0.5	0.21 LJ[1,4]	<1.900	0.500 LJ	0.07	<1.900	2.4	2.7	2.5	2.6	<2.4	<0.0019
SO-7	25-Jan-00	0-0.5	<0.470	<0.470	<0.470	<0.0047	<0.470	<0.470	<0.470	<0.470	<0.470	<0.470	<0.0024
SO-8	25-Jan-00	0-0.5	<0.390	<0.390	<0.390	<0.039	<0.390	<0.390	<0.390	<0.390	<0.390	<0.390	<0.0020
B7-3'	17-Mar-99	3	NA[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B8-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-1	25-Jan-00	0-0.5	<0.720	<0.720	<0.720	<0.036	<0.720	0.290 LJ	0.380 LJ	0.033 LJ	0.360 LJ	0.450 LJ	0.001 J
SO-2	25-Jan-00	0-0.5	<0.350	0.047 LJ	<0.350	<0.034	0.210 LJ	<0.350	<0.350	<0.350	<0.350	<0.350	<0.0018
SO-2RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-3	25-Jan-00	0-0.5	<0.380	<0.380	<0.380	0.034 LJ	<0.380	<0.380	0.049 LJ	<0.380	<0.380	0.079 LJ	<0.0019
SO-4	25-Jan-00	0-0.5	<1.900	<1.900	<1.900	0.15	<1.900	<1.900	<1.900	<1.900	<1.900	<1.900	<0.0019
SO-5	25-Jan-00	0-0.5	<37	<37	<37	<0.037	<37	<37	<37	<37	<37	<37	<0.0019
SO-5RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B3-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B5-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B10-3'	17-Mar-99	3	<0.33	NA	<0.33	NA	NA	<0.33	<0.33	<0.33	<0.33	<0.33	NA
B14-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 3 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Bis (2-ethylhexyl) phthalate (mg/Kg)	Carbazole (mg/Kg)	alpha-Chlordane (mg/Kg)	gamma-Chlordane (mg/Kg)	Chrysene (mg/Kg)	Dibenzo(a,h) anthracene (mg/Kg)	4,4-DDD (mg/Kg)	4,4-DDE (mg/Kg)	4,4-DDT (mg/Kg)	Dieldrin (mg/Kg)
SITE SAMPLES												
SO-6	25-Jan-00	0-0.5	<1.9	0.210 LJ	<0.0019	<0.0019	2.8	0.800 LJ	0.0079 J	0.005 J^(5)	0.0074 J^	0.0099 J^
SO-7	25-Jan-00	0-0.5	0.084 LJ	<0.470	<0.0024	<0.0024	<0.470	<0.470	<0.0047	<0.0047	<0.0047	<0.0047
SO-8	25-Jan-00	0-0.5	0.060 LJ	<0.390	<0.002	<0.002	<0.390	<0.390	<0.0039	<0.0039	<0.0039	<0.0039
B7-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B8-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-1	25-Jan-00	0-0.5	2.6 J	<0.720	<0.0018	<0.0018	0.400 LJ	0.130 LJ	<0.0036	<0.0036	<0.0036	<0.0036
SO-2	25-Jan-00	0-0.5	0.4	<0.350	<0.0018	<0.0018	<0.350	<0.350	<0.0034	<0.0034	<0.0034	<0.0034
SO-2RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-3	25-Jan-00	0-0.5	0.061 LJ	<0.380	<0.0019	<0.0019	0.043 LJ	<0.380	<0.0037	<0.0037	<0.0037	0.0062
SO-4	25-Jan-00	0-0.5	0.220 LJ	<1.900	0.0084 J^	0.02	<1.900	<1.900	0.0064 J^	0.0089 J^	0.015 J^	0.015 J^
SO-5	25-Jan-00	0-0.5	<37	<37	<0.0019	<0.0019	<37	<37	<0.0037	0.004 Jv(3)	<0.0037	<0.0037
SO-5RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B3-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B5-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B10-3'	17-Mar-99	3	<0.33	<0.33	NA	NA	<0.33	<0.33	NA	NA	NA	NA
B14-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 3 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Endrin (mg/Kg)	Endrin Aldehyde (mg/Kg)	Endrin Ketone (mg/Kg)	Fluoranthene (mg/Kg)	Fluorene (mg/Kg)	Heptachlor epoxide (mg/Kg)	Naphthalene (mg/Kg)	Phenanthrene (mg/Kg)	Pyrene (mg/Kg)	Indeno(1,2,3-cd) pyrene (mg/Kg)
SITE SAMPLES												
SO-6	25-Jan-00	0-0.5	<0.0037	<0.0037	<0.0037	5.1	0.250 LJ	<0.0019	<1.9	2.5	4.4	2.2
SO-7	25-Jan-00	0-0.5	<0.0047	<0.0047	<0.0047	<0.470	<0.470	<0.0024	<0.470	<0.470	<0.470	<0.470
SO-8	25-Jan-00	0-0.5	<0.0039	<0.0039	<0.0039	<0.390	<0.390	<0.002	<0.390	<0.390	<0.390	<0.390
B7-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA
B8-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA
SO-1	25-Jan-00	0-0.5	<0.0036	<0.0036	<0.0036	0.580 LJ	<0.720	<0.0018	<0.72	0.250 LJ	0.460 LJ	0.360 LJ
SO-2	25-Jan-00	0-0.5	<0.0034	<0.0034	<0.0034	<0.350	<0.350	<0.0018	<0.350	<0.350	<0.350	<0.350
SO-2RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-3	25-Jan-00	0-0.5	<0.0037	<0.0037	<0.0037	0.073 LJ	<0.380	<0.0019	<0.380	<0.380	0.071 LJ	0.063 LJ
SO-4	25-Jan-00	0-0.5	<0.0038	0.018 J^	0.013 J	<1.900	<1.900	<0.0019	<1.900	<1.900	<1.900	<1.900
SO-5	25-Jan-00	0-0.5	0.004 Jv	<0.0037	<0.0037	<37	<37	<0.0019	<37	<37	<37	<37
SO-5RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B3-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA
B4-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA
B5-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA
B10-3'	17-Mar-99	3	NA	NA	NA	<0.33	<0.33	NA	0.0611	<0.33	<0.33	<0.33
B14-3'	17-Mar-99	3	NA	NA	NA	NA	NA	NA	<0.002	NA	NA	NA

TABLE 3 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Acena-phthene (mg/Kg)	Aceto-phenone (mg/Kg)	Anthracene (mg/Kg)	Aroclor 1254 (mg/Kg)	Benzaldehyde (mg/Kg)	Benzo(a) anthracene (mg/Kg)	Benzo (b) fluoranthene (mg/Kg)	Benzo(k) fluoranthene (mg/Kg)	Benzo(a) pyrene (mg/Kg)	Benzo(g,h,i) perylene (mg/Kg)	beta-BHC (mg/Kg)
BACKGROUND SAMPLES													
SO-9	25-Jan-00	0-0.5	<0.440	<0.440	<0.440	<0.043	<0.440	<0.440	<0.440	<0.440	<0.440	<0.440	<0.0022
SO-9RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-10	25-Jan-00	0-0.5	<0.440	<0.440	<0.440	<0.045	<0.440	<0.440	<0.440	<0.440	<0.440	<0.440	<0.0023
SO-10RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-11	25-Jan-00	0-0.5	<0.430	<0.430	<0.430	<0.043	<0.430	<0.430	<0.430	<0.430	<0.430	<0.430	<0.0022
SO-11RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Screening Level			20[7]	None	None	40[7]	None	None	None	None	None	None	None

TABLE 3 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Bis (2-ethylhexyl) phthalate (mg/Kg)	Carbazole (mg/Kg)	alpha-Chlordane (mg/Kg)	gamma-Chlordane (mg/Kg)	Chrysene (mg/Kg)	Dibenzo(a,h) anthracene (mg/Kg)	4,4-DDD (mg/Kg)	4,4-DDE (mg/Kg)	4,4-DDT (mg/Kg)	Dieldrin (mg/Kg)
BACKGROUND SAMPLES												
SO-9	25-Jan-00	0-0.5	0.046 LJ	<0.440	<0.0022	<0.0022	<0.440	<0.440	<0.0043	<0.0043	<0.0043	<0.0043
SO-9RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-10	25-Jan-00	0-0.5	<0.440	<0.440	<0.0023	<0.0023	<0.440	<0.440	<0.0045	<0.0045	<0.0045	<0.0045
SO-10RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-11	25-Jan-00	0-0.5	<0.430	<0.430	<0.0022	<0.0022	<0.430	<0.430	<0.0043	<0.0043	<0.0043	<0.0043
SO-11RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Screening Level			None	None	None	None	None	None	None	None	None	0.000032[B]

TABLE 3 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SOIL SAMPLES

Sample ID	Date Sampled	Depth (ft bgl)	Endrin (mg/Kg)	Endrin Aldehyde (mg/Kg)	Endrin Ketone (mg/Kg)	Fluoranthene (mg/Kg)	Fluorene (mg/Kg)	Heptachlor epoxide (mg/Kg)	Naphthalene (mg/Kg)	Phenanthrene (mg/Kg)	Pyrene (mg/Kg)	Indeno(1,2,3-cd) pyrene (mg/Kg)
BACKGROUND SAMPLES												
SO-9	25-Jan-00	0-0.5	<0.0043	<0.0043	<0.0043	<0.440	<0.440	<0.0022	<0.440	<0.440	<0.440	<0.440
SO-9RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-10	25-Jan-00	0-0.5	<0.0045	<0.0045	<0.0045	<0.440	<0.440	<0.0023	<0.440	<0.440	<0.440	<0.440
SO-10RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SO-11	25-Jan-00	0-0.5	<0.0043	<0.0043	<0.0043	<0.430	<0.430	<0.0022	<0.430	<0.430	<0.430	<0.430
SO-11RE	25-Jan-00	0-0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Screening Level			None	None	None	None	30*[7]	None	None	None	None	None

Notes:

1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = Not analyzed.
3. v= Low biased. Actual concentration may be higher than the concentration reported.
4. J= Estimated value.
5. ^= High biased. Actual concentration may be lower than the concentration reported.
6. Only compounds detected in at least one sample are included in this table.
7. From Table 3-4 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas". Values indicated with "*" are based on earthworms. All other values are based on plant exposure. Criteria for PCBs overall listed for Arochlor 1254 (no archlor-specific values available).
8. From EPA's "Ecological Soil Screening Level". Values indicated with "+" are based on plants. Values indicated with "++" are based on Soil Invertebrates. Values indicated with "+++" are based on avian wildlife. All other values are based on mammalian wildlife.
9. Shaded values exceed the Screening Levels reported.

TABLE 4 - SUMMARY OF METALS CONCENTRATIONS IN SEDIMENT SAMPLES

Sample ID	Date Sampled	Data Source	Aluminum mg/Kg	Arsenic mg/Kg	Barium mg/Kg	Beryllium mg/Kg	Calcium mg/Kg	Chromium mg/Kg	Cobalt mg/Kg	Copper mg/Kg	Iron mg/Kg	Lead mg/Kg	Magnesium mg/Kg	Manganese mg/Kg	Nickel mg/Kg	Potassium mg/Kg	Sodium mg/Kg	Vanadium mg/Kg	Zinc mg/Kg
SITE SAMPLES																			
SE-8	25-Jan-00	TNRCC, 2000	8,560	5.2	506	0.47 L[3]	10,900	18.8	5.1 L	25.8	19,000	46.8	4,920	300 Jv[1,4]	14.4	2,960	4,400	15.7	314.0
SE-9	25-Jan-00	TNRCC, 2000	10,000	5.8	440	0.57 L	13,500	17.3	6.1 L	23.7	15,500	27.9	5,690	314 Jv	13	3,480	4,820	17.5	130
SE-10	25-Jan-00	TNRCC, 2000	12,000	5.8	354	0.63 L	21,600	17.4	6.7 L	20.6	19,000	21.8	7,040	376 Jv	15	4,200	4,720	20.4	220.0
SE-11	25-Jan-00	TNRCC, 2000	5,620	3.4	439	0.33 L	13,500	8.7	3.6 L	8.9	8,470	32.8	3,620	191 Jv	7.2 L	2,130	3,500	11.3 L	37.8
OFF-SITE SAMPLES																			
SE-3	25-Jan-00	TNRCC, 2000	14,100	3.6	150	0.80 L	23,400	15.5	5.9 L	37.4	14,400	11.2	8,840	240 Jv	16	5,100	6,040	23.9	58.8
SE-4	25-Jan-00	TNRCC, 2000	15,400	6.8	172	0.93 L	15,500	16.6	7.7 L	26.0	15,700	11.7	11,600	216 Jv	18.1	5,470	6,910	26.5	40.6
SE-6	25-Jan-00	TNRCC, 2000	13,000	3.9	132	0.85 L	3,040	15.6	7.8 L	14.1	13,600	10.2	7,620	153 Jv	18.7	5,460	5,410	23.4	39.4
SE-7	25-Jan-00	TNRCC, 2000	20,500	6.4	152	1.1 L	33,500	21.9	7.8 L	21.2	24,500	15.6	11,400	356 Jv	20.1	6,650	6,770	42.2	48
SE-16	25-Jan-00	TNRCC, 2000	16,200	4.6	218	0.95 L	14,300	18.2	6.5 L	13.2	17,300	8.1	8,940	193 Jv	18.3	6,130	5,920	23.1	45.5
POND SAMPLES																			
SE-12	25-Jan-00	TNRCC, 2000	16,000	9.8	213	0.94 L	17,600	18.1	15.5	14.8	20,500	14.7	9,360	1,320 Jv	20.5	5,620	5,160	31.5	53
SE-13[7]	25-Jan-00	TNRCC, 2000	15,200	5.5	94	0.88 L	12,300	17.0	7.8 L	11.4	17,400	11.2	9,050	421 Jv	17.8	5,440	5,040	24.1	45.4
SE-14	25-Jan-00	TNRCC, 2000	12,500	3.7	49.3 L	0.89 L	1,950	15.2	7.2 L	13.1	14,000	13.9	7,750	229 Jv	17.7	4,310	4,890	18.8	50.5
SS-5	16-Mar-99	LTE, 1999	NA[2]	1.84	67.1	NA	NA	7.14	NA	NA	NA	5.92	NA	NA	NA	NA	NA	NA	NA
SS-6	16-Mar-99	LTE, 1999	NA	1.91	55.7	NA	NA	6.49	NA	NA	NA	6.68	NA	NA	NA	NA	NA	NA	NA
BACKGROUND SAMPLES																			
SE-1	25-Jan-00	TNRCC, 2000	9,570	3.7	195	0.58 L	19,900	11.3	5.3 L	13.0	11,600	8.6	7,450	465 Jv	11.6 L	3,760	6,490	18	30.1
SE-2[8]	25-Jan-00	TNRCC, 2000	7,680	5.8	151	0.50 L	37,300	9.2	6.7 L	9.0	10,700	11.1	7,380	530 Jv	10.2 L	3,110	6,430	18.3	24.4
SE-5	25-Jan-00	TNRCC, 2000	160,000	5.2	141	1.1 L	1,640	17.8	8.5 L	17.7	21,500	12.3	9,890	282 Jv	22.2	6,080	6,190	21.8	48
SE-15	25-Jan-00	TNRCC, 2000	23,500	5.6	235	1.2 L	15,100	24.6	11.0 L	17.7	23,600	12.6	15,600	1,350 Jv	25.5	7,700	6,340	30.8	54.4
Screening Level[5]			None	8.2	None	None	None	81	None	34	None	46.7	None	None	21	None	None	None	150

Notes:
1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = not analyzed.
3. v= Low biased. Actual concentration may be higher than the concentration reported.
4. J= Estimated Value.
5. From EPA, 1996 and Table 3-3 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas" for marine sediments.
6. Shaded values exceed screening level.
7. Duplicate of SE-12.
8. Duplicate of SE-1.

TABLE 5 - SUMMARY OF VOC CONCENTRATIONS IN SEDIMENT SAMPLES

Sample ID	Date Sampled	Data Source	Acetone mg/Kg	Carbon Disulfide mg/Kg	Methylene Chloride mg/Kg	Toluene mg/Kg
SITE SAMPLES						
SE-8	25-Jan-00	TNRCC, 2000	0.044	<0.016	0.015 LJ	<0.016
SE-9	25-Jan-00	TNRCC, 2000	0.050	0.004 JL[1,3]	0.015	<0.014
SE-10	25-Jan-00	TNRCC, 2000	0.020	<0.014	0.017	<0.014
SE-11	25-Jan-00	TNRCC, 2000	0.038 B[4]	0.003 LJ	<0.015	<0.015
OFF-SITE SAMPLES						
SE-3	25-Jan-00	TNRCC, 2000	0.074 B	0.011 LJ	0.025	<0.018
SE-4	25-Jan-00	TNRCC, 2000	0.058 B	0.003 LJ	0.021	<0.017
SE-6	25-Jan-00	TNRCC, 2000	0.0410	<0.015	0.0200	<0.015
SE-7	25-Jan-00	TNRCC, 2000	0.098	<0.016	0.018	<0.016
SE-16	25-Jan-00	TNRCC, 2000	0.0180	<0.014	<0.014	<0.014
POND SAMPLES						
SE-12	25-Jan-00	TNRCC, 2000	0.016M[5]	<0.014	<0.014	<0.014
SE-13[8]	25-Jan-00	TNRCC, 2000	0.031	<0.012	<0.012	<0.012
SE-14	25-Jan-00	TNRCC, 2000	<0.013	<0.013	<0.013	<0.013
SS-5	16-Mar-99	LTE, 1999	<0.01	<0.002	<0.01	0.0027
SS-6	16-Mar-99	LTE, 1999	<0.01	<0.002	<0.01	<0.002
BACKGROUND SAMPLES						
SE-1	25-Jan-00	TNRCC, 2000	<0.014	<0.014	0.011 LJ	<0.014
SE-2[9]	25-Jan-00	TNRCC, 2000	<0.014	<0.014	0.013 LJ	<0.014
SE-5	25-Jan-00	TNRCC, 2000	0.044 B	<0.016	0.016 LJ	<0.016
SE-15	25-Jan-00	TNRCC, 2000	0.032	0.001 LJ	<0.011	<0.011
Screening Level [6]			167.23	None	3.82	0.94

Notes:

1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = not analyzed.
3. J= Estimated Value.
4. B= Result may be high biased due to lab/field contamination. Reported concentration >5x or 10x concentration in method/field blank.
5. M= Reported concentration should be used as a raised quantitation limit because of interference and/or laboratory contamination.
6. From Table 3-3 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas" for marine sediments.
7. No exceedences of screening levels.
8. Duplicate of SE-12.
9. Duplicate of SE-1.

TABLE 6 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SEDIMENT SAMPLES

Sample ID	Date Sampled	Data Source	Acena-phthene mg/Kg	Anthracene mg/Kg	Aroclor 1254 mg/Kg	Benzo(a) anthracene mg/Kg	Benzo (b) fluoranthene mg/Kg	Benzo(k) fluoranthene mg/Kg	Benzo(g,h,I) perylene mg/Kg	Benzo(a) pyrene mg/Kg
SITE SAMPLES										
SE-8	25-Jan-00	TNRCC, 2000	0.130 LJ [2]	0.210 LJ [3]	0.027 LJ	0.760 LJ	0.870 LJ	0.740 LJ	0.550 LJ	0.810 LJ
SE-9	25-Jan-00	TNRCC, 2000	<2.300	<2.300	0.023 LJ	<2.3	0.300 LJ	<2.3	<2.3	0.240 LJ
SE-10	25-Jan-00	TNRCC, 2000	<0.460	<0.460	<0.046	<0.460	<0.460	<0.460	<0.460	<0.460
SE-11	25-Jan-00	TNRCC, 2000	<0.430	<0.430	<0.044	<0.430	<0.430	<0.430	<0.430	<0.430
OFF-SITE SAMPLES										
SE-3	25-Jan-00	TNRCC, 2000	<0.540	<0.540	<0.054	<0.540	<0.540	<0.540	<0.540	<0.540
SE-4	25-Jan-00	TNRCC, 2000	<0.580	<0.580	<0.057	<0.580	<0.580	<0.580	<0.580	<0.580
SE-6	25-Jan-00	TNRCC, 2000	<0.460	<0.460	<0.0047	<0.460	<0.460	<0.460	<0.460	<0.460
SE-7	25-Jan-00	TNRCC, 2000	<0.510	<0.510	<0.051	<0.510	<0.510	<0.510	<0.510	<0.510
SE-16	25-Jan-00	TNRCC, 2000	<0.450	<0.450	<0.044	<0.450	<0.450	<0.450	<0.450	<0.450
POND SAMPLES										
SE-12	25-Jan-00	TNRCC, 2000	<0.460	<0.460	<0.046	<0.460	<0.460	<0.460	<0.460	<0.460
SE-13 [6]	25-Jan-00	TNRCC, 2000	<0.460	<0.460	<0.046	<0.460	<0.460	<0.460	<0.460	<0.460
SE-14	25-Jan-00	TNRCC, 2000	<0.440	<0.440	<0.043	<0.440	<0.440	<0.440	<0.440	<0.440
SS-5	16-Mar-99	LTE, 1999	NA	NA	NA	NA	NA	NA	NA	NA
SS-6	16-Mar-99	LTE, 1999	NA	NA	NA	NA	NA	NA	NA	NA
BACKGROUND SAMPLES										
SE-1	25-Jan-00	TNRCC, 2000	<0.480	<0.480	<0.048	<0.480	<0.480	<0.480	<0.480	<0.480
SE-2 [7]	25-Jan-00	TNRCC, 2000	<0.460	<0.460	<0.046	<0.460	<0.460	<0.460	<0.460	<0.460
SE-5	25-Jan-00	TNRCC, 2000	<0.490	<0.490	<0.050	<0.490	<0.490	<0.490	<0.490	<0.490
SE-15	25-Jan-00	TNRCC, 2000	<0.440	<0.440	<0.044	<0.440	<0.440	<0.440	<0.440	<0.440
Screening Level [4]			0.016	0.0853	0.023	0.261	None	None	None	0.43

TABLE 6 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN SEDIMENT SAMPLES

Sample ID	Date Sampled	Data Source	Bis (2-ethylhexyl)) phthalate mg/Kg	Carbazole mg/Kg	gamma-Chlordane mg/Kg	Chrysene mg/Kg	Fluoranthene mg/Kg	Fluorene mg/Kg	Heptachlor epoxide mg/Kg	Phenanthrene mg/Kg	Pyrene mg/Kg	Indeno(1,2,3-cd) pyrene mg/Kg
SITE SAMPLES												
SE-8	25-Jan-00	TNRCC, 2000	1.2	0.110 LJ	0.0055	0.870 LJ	2	0.150 LJ	<0.0024	1.2	2	0.570 LJ
SE-9	25-Jan-00	TNRCC, 2000	0.240 LJ	<2.300	<0.0024	0.310 LJ	0.600 LJ	<2.300	0.0038	0.350 LJ	0.640 LJ	<2.3
SE-10	25-Jan-00	TNRCC, 2000	0.110 LJ	<0.460	<0.0024	<0.460	<0.460	<0.460	<0.0024	<0.460	<0.460	<0.460
SE-11	25-Jan-00	TNRCC, 2000	0.550 J	<0.430	<0.0022	<0.430	<0.430	<0.430	<0.0022	<0.430	<0.430	<0.430
OFF-SITE SAMPLES												
SE-3	25-Jan-00	TNRCC, 2000	<0.540	<0.540	<0.0028	<0.540	<0.540	<0.540	<0.0028	<0.540	<0.540	<0.540
SE-4	25-Jan-00	TNRCC, 2000	0.079 LJ	<0.580	<0.003	<0.580	<0.580	<0.580	<0.003	<0.580	<0.580	<0.580
SE-6	25-Jan-00	TNRCC, 2000	0.230 LJ	<0.460	<0.0024	<0.460	<0.460	<0.460	<0.0024	<0.460	<0.460	<0.460
SE-7	25-Jan-00	TNRCC, 2000	0.110 LJ	<0.510	<0.0026	<0.510	<0.510	<0.510	<0.0026	<0.510	<0.510	<0.510
SE-16	25-Jan-00	TNRCC, 2000	0.340 LJ	<0.450	<0.0023	<0.450	<0.450	<0.450	<0.0023	<0.450	<0.450	<0.450
POND SAMPLES												
SE-12	25-Jan-00	TNRCC, 2000	<0.460	<0.460	<0.0024	<0.460	<0.460	<0.460	<0.0024	<0.460	<0.460	<0.460
SE-13[6]	25-Jan-00	TNRCC, 2000	<0.460	<0.460	<0.0023	<0.460	<0.460	<0.460	<0.0023	<0.460	<0.460	<0.460
SE-14	25-Jan-00	TNRCC, 2000	0.073 LJ	<0.440	<0.0022	<0.440	<0.440	<0.440	<0.0022	<0.440	<0.440	<0.440
SS-5	16-Mar-99	LTE, 1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SS-6	16-Mar-99	LTE, 1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BACKGROUND SAMPLES												
SE-1	25-Jan-00	TNRCC, 2000	<0.480	<0.480	<0.0025	<0.480	<0.480	<0.480	<0.0025	<0.480	<0.480	<0.480
SE-2[7]	25-Jan-00	TNRCC, 2000	0.150 LJ	<0.460	<0.0024	<0.460	<0.460	<0.460	<0.0024	<0.460	<0.460	<0.460
SE-5	25-Jan-00	TNRCC, 2000	<0.490	<0.490	<0.0026	<0.490	<0.490	<0.490	<0.0026	<0.490	<0.490	<0.490
SE-15	25-Jan-00	TNRCC, 2000	0.070 LJ	<0.440	<0.0023	<0.440	<0.440	<0.440	<0.0023	<0.440	<0.440	<0.440
Screening Level [4]			0.182	None	0.00226	0.384	0.6	0.019	None	0.24	0.665	None

Notes:
1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = not analyzed.
3. J= Estimated Value.
4. FromEPA, 1996 and Table 3-3 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas" for marine sediments.
5. Shaded values exceed screening level.
6. Duplicate of SE-12.
7. Duplicate of SE-1.

TABLE 7 - SUMMARY OF VOC CONCENTRATIONS IN SURFACE WATER SAMPLES

Sample ID	Date Sampled	Chloroform (mg/L)	1,2-Dichloro ethane (mg/L)
SW1	03/16/99	<0.002	<0.002
SW2[1]	03/16/99	<0.002	<0.002
SW3	03/16/99	<0.002	<0.002
SW4[1]	03/16/99	0.006	0.0039
Screening Level [2]		4.1	5.65

Notes:

1. Sample of accumulated water from inside former AST tank farm containment area.
2. From Table 3-2 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas".
3. Only VOCs detected in at least one sample included in this table.

TABLE 8 - SUMMARY OF METALS CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Aluminum (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Cyanide (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)
SITE SAMPLES														
GW-1	25-Jan-01	130 Jv[4,3]	0.0777	0.501	0.0037 LJv[1]	0.0022 L	807 Jv	0.0774	0.0669	0.273	0.0021 L	103	0.0947	1,420
GW-2	25-Jan-01	22.2 J	0.0102	0.593	<0.0004	0.0008 L	583 Jv	<0.0112 C[6]	<0.0018	0.043	<0.0014	38.5	0.0203	870
GW-3	25-Jan-01	9.29 Jv	0.0426	0.108 L	<0.0004	0.0013 L	858 Jv	<0.0016	<0.0018	0.0223 L	<0.0014	21.9	<0.0025	1,560
GW-5	25-Jan-01	118 Jv	0.0706	0.468	0.0034 LJv	0.0024 L	815 Jv	0.0672	0.0606	0.266	<0.0014	95.1	0.0864	1,370
GW-6	25-Jan-01	39.5 Jv	0.0124	0.401	0.0006 LJv	0.001 L	696 Jv	0.0134 J^[5]	<0.0018	0.040	<0.0014	25.9	0.0078	1,710
GW-7	25-Jan-01	51.1 Jv	0.0493	0.292	0.0017 LJv	0.002 L	883 Jv	0.0230	0.0179 LJ^	0.114	<0.0014	52.8	0.0704	1,450
GW-8	26-Jan-01	39.4 Jv	0.0096 LJ	0.340	0.0007 LJv	<0.0009 LC	665 Jv	0.0183	<0.0018	0.045	0.0026 L	41.2	0.0152	1,190
GW-9	25-Jan-01	28.8 Jv	0.008 LJ	0.348	<0.0004	0.0006 L	831 Jv	<0.0016	<0.0018	0.0226 L	<0.0014	31.9	<0.0025	2,020
MW-1	26-Jan-00	0.246 Jv	NA	NA	<0.005	NA	NA	<0.01	<0.05	<0.025	NA	30.3 Jv	UR[7]	NA
	16-Mar-99	NA[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	26-Jan-00	16.2	NA	NA	0.0012	NA	NA	0.0146	<0.05	0.046	NA	22.1 Jv	0.0146 Jv	NA
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	26-Jan-00	77	NA	NA	0.0060	NA	NA	0.0854	0.0862	0.273	NA	89.0 Jv	0.0945 Jv	NA
Dup.	26-Jan-00	61.5	NA	NA	0.0054	NA	NA	0.0665	0.0722	0.220	NA	76.2 Jv	0.0915 Jv	NA
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-4	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-5	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-6	18-Mar-99	NA	0.010	0.067	ND	<0.001	NA	0.0140	NA	NA	NA	NA	<0.003	NA
LGW-7	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-8	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-9	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 8 - SUMMARY OF METALS CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Manganese (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Sodium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
SITE SAMPLES									
GW-1	25-Jan-01	8.46	0.00079 Jv	0.217	274	<0.0017	10000	0.196	0.201
GW-2	25-Jan-01	2.01	<0.0001 Jv	0.0309 L	179	<0.0017	7490	0.0537	0.0598
GW-3	25-Jan-01	14.1	<0.0001 Jv	0.0172 LJ^	249	0.002 L	11400	<0.0144 LC	0.0183 L
GW-5	25-Jan-01	8.66	0.00071 Jv	0.216	281	<0.0017	9780	0.178	0.178
GW-6	25-Jan-01	4.3	<0.0001 Jv	0.0408	366	<0.0017	14000	0.0582	0.0816
GW-7	25-Jan-01	8.19	0.00011 LJv	0.0696	250	<0.0017	10100	0.098	0.109
GW-8	26-Jan-01	2.37	0.00026 Jv	0.0346 L	297	<0.0017	9740	0.0526	0.136
GW-9	25-Jan-01	4.32	<0.0001 Jv	0.0234 L	372	<0.0017	14200	0.037 L	0.108
MW-1	26-Jan-00	7.93 Jv	NA	0.0022	NA	NA	NA	<0.05	<0.02
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	26-Jan-00	2.93 Jv	NA	0.0253	NA	NA	NA	0.0356	0.0285
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	26-Jan-00	5.14 Jv	NA	0.155	NA	NA	NA	0.142	0.279
Dup.	26-Jan-00	4.74 Jv	NA	0.123	NA	NA	NA	0.132	0.226
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA
LGW-4	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA
LGW-5	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA
LGW-6	18-Mar-99	NA	<0.0002	NA	NA	<0.005	NA	NA	NA
LGW-7	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA
LGW-8	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA
LGW-9	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 8 - SUMMARY OF METALS CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Aluminum (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Cyanide (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)
BACKGROUND SAMPLES														
GW-10	24-Jan-01	11.8 Jv	0.0091 L	0.121 L	<0.0004	<0.0004	540 Jv	<0.0016	<0.0018	0.0264	<0.0014	13.7	<0.0025	1,040
GW-11	25-Jan-01	45.1 Jv	0.0102	0.260	0.0008 LJv	0.0004 L	113 Jv	0.0434	0.0174 L	0.0364	<0.0014	38	0.0244	89.2
Screening Level [5]		None	0.780	None	None	0.010	None	10	None	0.0036	0.0056	None	0.005	None

TABLE 8 - SUMMARY OF METALS CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Manganese (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Sodium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
BACKGROUND SAMPLES									
GW-10	24-Jan-01	2.81	0.0007 Jv	<0.0108 LC	163	<0.0017	8,550	0.0161 LJ^	0.0259
GW-11	25-Jan-01	1.36	<0.0001 Jv	0.0468	62.5	<0.0017	1110	0.0649	0.107
Screening Level [8]		None	0.0011	0.0131	None	0.136	None	None	0.0842

Notes:

1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = Not analyzed.
3. v= Low biased. Actual concentration may be higher than the concentration reported.
4. J= Estimated value.
5. ^= High biased. Actual concentration may be higher than the concentration reported.
6. C= Reported concentration should be used as a raised detection limit because of apparent blank contamination.
7. UR = Not detected at sample quantitation limit and unusable because of very low matrix spike recovery.
8. From Table 3-2 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas".
9. Shaded values exceed screening level.

TABLE 9 - SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Acetone (mg/L)	Benzene (mg/L)	Carbon Disulfide (mg/L)	Carbon Tetrachloride (mg/L)	Chloroform (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	t-1,2-DCE (mg/L)	c-1,2-DCE (mg/L)	1,2-dichloro propane (mg/L)	Ethyl-benzene (mg/L)
SITE SAMPLES													
GW-1	25-Jan-01	<0.01	18 LJ [1][4]	0.048 J	<0.01	0.072 J	1.7 J	<0.01	32 LJ	<0.01	<0.01	1.90 J	<0.01
GW-2	25-Jan-01	<0.01	0.002 LJ	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-3	25-Jan-01	<0.01	6.2 LJ	<0.01	<0.01	0.079 J	1.6 J	99	29 LJ	0.053 J	4.9 J	2.1 J	0.040
GW-4	25-Jan-01	<5.0	<5.0	<5.0	<5.0	1.2 LJ	12	2,800 Jv [3]	2.0 LJ	<5.0	<5.0	<5.0	<5.0
GW-5	25-Jan-01	<5.0	16	<5.0	<5.0	<5.0	<5.0	9.7	30	<5.0	<5.0	<5.0	<5.0
GW-6	25-Jan-01	<0.029 M [5]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-7	25-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-8	26-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-9	25-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-1	26-Jan-00	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MW-2	26-Jan-00	<0.010	<0.010	0.002 LJ		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MW-3	26-Jan-00	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dup	26-Jan-00	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dup	16-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-4	18-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-5	18-Mar-99	0.256	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-6	18-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-7	18-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-8	18-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-9	18-Mar-99	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

TABLE 9 - SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Isopropyl benzene (mg/L)	Methylene Chloride (mg/L)	4-methyl-2 pentanone (mg/L)	PCE (mg/L)	1,1,1-TCA (mg/L)	1,1,2-TCA (mg/L)	TCE (mg/L)	1,1,2,2-tetra chlorothane (mg/L)	Toluene (mg/L)	Trichloro fluoromethane (mg/L)	Vinyl Chloride (mg/L)
SITE SAMPLES												
GW-1	25-Jan-01	24 LJ	750 Jv	0.30 J	29 LJ	93 Jv	0.046	53 Jv	0.016	0.61 J	<0.01	1.1 J
GW-2	25-Jan-01	0.004 LJ	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-3	25-Jan-01	0.120	670	0.170	22 LJ	93	0.035	92	<0.01	0.59 J	<0.01	1.9 J
GW-4	25-Jan-01	1.6 LJ	77	<5.0	3.4 LJ	93	<5.0	11	<5.0	0.78 LJ	<5.0	17
GW-5	25-Jan-01	22	450 Jv	<5.0	25	83	<5.0	49	<5.0	<5.0	<5.0	1.6 LJ
GW-6	25-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-7	25-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-8	26-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-9	25-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW-1	26-Jan-00	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010
	16-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MW-2	26-Jan-00	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010
	16-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MW-3	26-Jan-00	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010
Dup	26-Jan-00	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.010
	16-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dup	16-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-4	18-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-5	18-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-6	18-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-7	18-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-8	18-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
LGW-9	18-Mar-99	<0.002	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

TABLE 9 - SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Acetone (mg/L)	Benzene (mg/L)	Carbon Disulfide (mg/L)	Carbon Tetrachloride (mg/L)	Chloroform (mg/L)	1,1-DCA (mg/L)	1,2-DCA (mg/L)	1,1-DCE (mg/L)	t-1,2-DCE (mg/L)	c-1,2-DCE (mg/L)	1,2-dichloro propane (mg/L)	Ethyl-benzene (mg/L)
BACKGROUND SAMPLES													
GW-10	24-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-11	25-Jan-01	<0.028 M	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Screening Level [6]		564	0.109	None	1.5	4.1	None	5.65	25	None	None	2.4	0.5

TABLE 9 - SUMMARY OF VOC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Isopropyl benzene (mg/L)	Methylene Chloride (mg/L)	4-methyl-2 pentanone (mg/L)	PCE (mg/L)	1,1,1-TCA (mg/L)	1,1,2-TCA (mg/L)	TCE (mg/L)	1,1,2,2-tetra chlorothane (mg/L)	Toluene (mg/L)	Trichloro fluoromethane (mg/L)	Vinyl Chloride (mg/L)
BACKGROUND SAMPLES												
GW-10	24-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-11	25-Jan-01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Screening Level [6]		None	1.09	12.3	1.45	3.1	0.55	1.94	None	0.95	None	None

Notes:

1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = Not analyzed.
3. v= Low biased. Actual concentration may be higher than the concentration reported.
4. J= Estimated value.
5. M= Reported concentration should be used as a raised quantitation limit because of interferences and/or laboratory contamination.
6. From Table 3-2 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas".
7. Shaded values exceed screening level.

TABLE 10 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Acenaphthene (mg/L)	Acetophenone (mg/L)	Aldrin (mg/L)	Anthracene (mg/L)	alpha-BHC (mg/L)	beta-BHC (mg/L)	delta-BHC (mg/L)	gamma-BHC (Lindane) (mg/L)	Benzaldehyde (mg/L)	Benzo (a) anthracene (mg/L)	1,1-Biphenyl (mg/L)	bis(2-chloroethyl) ether (mg/L)	Bis (2-ethylhexyl) phthalate (mg/L)
SITE SAMPLES														
GW-1	25-Jan-01	<0.01 Jv[4,3]	0.064 Jv	0.000099 J	<0.01 Jv	0.00034 J	0.00025 J	0.00006 J	0.00021 J	<0.01 Jv	<0.01 Jv	<0.01 Jv	<0.01 Jv	<0.01 Jv
GW-2	25-Jan-01	<0.01	<0.01	<0.00005	<0.01	<0.00005	<0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01
GW-3	25-Jan-01	<0.01	0.023	0.000085 J	<0.01	0.00048 J	<0.00005	0.000092 J	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01
GW-4	25-Jan-01	0.015 LJ[1]	0.12	<0.00005	0.0071 J	<0.00005	<0.00005	<0.00005	0.00059 J	0.056	<0.05	0.008 LJ	0.031 LJ	<0.05
GW-5	25-Jan-01	<0.01	0.094	0.000096 J	<0.01	<0.00005	0.00075 J	<0.00005	0.00033 J	<0.01	<0.01	0.001 LJ	<0.01	<0.01
GW-6	25-Jan-01	<0.01	<0.01	<0.00005	<0.01	<0.00005	<0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01
GW-7	25-Jan-01	<0.01	<0.01	<0.00005	<0.01	<0.00005	<0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01
GW-8	26-Jan-01	<0.01	<0.01	<0.00005	<0.01	<0.00005	<0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01
GW-9	25-Jan-01	<0.01	<0.01	<0.00005	<0.01	<0.00005	<0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01
MW-1	26-Jan-00	<0.010	<0.010	<0.00005	<0.010	<0.00005	<0.00005	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	NA[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	26-Jan-00	<0.010	<0.010	<0.00005	<0.010	<0.00005	<0.00005	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	26-Jan-00	<0.010	<0.010	<0.00005	<0.010	<0.00005	<0.00005	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010
Dup	26-Jan-00	<0.010	<0.010	<0.00005	<0.010	<0.00005	<0.00005	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dup	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-4	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-5	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-6	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-7	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-8	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-9	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 10 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Butylbenzyl phthalate (mg/L)	Capro-lactam (mg/L)	Carbazole (mg/L)	alpha-Chlordane (mg/L)	Chrysene (mg/L)	Dibenzo-furan (mg/L)	Di-ethyl phthalate (mg/L)	Di-n-butyl phthalate (mg/L)	4,4-DDD (mg/L)	4,4-DDE (mg/L)	4,4-DDT (mg/L)	Dieldrin (mg/L)	Endo-Sulfan (mg/L)	Endrin (mg/L)	Fluor anthene (mg/L)	Fluorene (mg/L)
SITE SAMPLES																	
GW-1	25-Jan-01	<0.01 Jv	<0.01 Jv	<0.01 Jv	<0.001	<0.01 Jv	<0.01 Jv	<0.01 Jv	<0.01 Jv	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00013 J	<0.01 Jv	<0.01 Jv
GW-2	25-Jan-01	<0.01	<0.01	<0.01	<0.001	0.001 LJ	<0.01	<0.01	0.001 LJ	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.001 LJ	<0.01
GW-3	25-Jan-01	<0.01	<0.01	<0.01	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
GW-4	25-Jan-01	<0.05	<0.05	0.037 LJ	<0.001	0.01 LJ	0.008 LJ	<0.05	<0.05	<0.0001	<0.0001	0.00014 J	0.00019 J	0.00042 J	<0.0001	0.011 LJ	0.012 LJ
GW-5	25-Jan-01	<0.01	0.003 LJ	<0.01	0.000053	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00032 J	<0.01	<0.01
GW-6	25-Jan-01	<0.01	<0.01	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
GW-7	25-Jan-01	<0.01	<0.01	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
GW-8	26-Jan-01	<0.01	<0.01	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
GW-9	25-Jan-01	<0.01	<0.01	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
MW-1	26-Jan-00	<0.010	<0.010	<0.010	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	26-Jan-00	<0.010	<0.010	<0.010	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	26-Jan-00	<0.010	<0.010	<0.010	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.010	<0.010
Dup	26-Jan-00	<0.010	<0.010	<0.010	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dup	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-4	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-5	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-6	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-7	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-8	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-9	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 10 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Heptachlor (mg/L)	Heptachlor epoxide (mg/L)	2-Methyl-phenol (mg/L)	4-Methyl phenol (mg/L)	2-Methyl naphthalene (mg/L)	Naph-thalene (mg/L)	2,2-oxybis (1-chloropropane) (mg/L)	Phenan threne (mg/L)	Phenol (mg/L)	Pyrene (mg/L)
SITE SAMPLES											
GW-1	25-Jan-01	0.00017	0.00058 J	0.004 LJ	0.008 LJ	0.001 LJv	0.005 LJv	<0.01 Jv	<0.01 Jv	0.024 J	<0.01 Jv
GW-2	25-Jan-01	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	0.003 LJ	<0.01	0.002 LJ
GW-3	25-Jan-01	<0.00005	<0.00005	0.029	0.041	0.002 LJ	0.012	0.023 J	<0.01	0.042	<0.01
GW-4	25-Jan-01	<0.00005	<0.00005	0.027 LJ	0.042 LJ	0.056	0.23	0.380 J	0.034 LJ	0.051	0.015 LJ
GW-5	25-Jan-01	0.00015 J	0.0015 J	0.007 LJ	0.011	0.001 LJ	0.008 LJ	<0.01	<0.01	0.046 J	<0.01
GW-6	25-Jan-01	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-7	25-Jan-01	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01 NA	<0.01	<0.01	<0.01
GW-8	26-Jan-01	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-9	25-Jan-01	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	0.001 LJ	<0.01	<0.01	<0.01
MW-1	26-Jan-00	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2	26-Jan-00	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	26-Jan-00	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dup	26-Jan-00	<0.00005	<0.00005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dup	16-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-4	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-5	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-6	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-7	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-8	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LGW-9	18-Mar-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 10 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Acena-phthene (mg/L)	Aceton-phenone (mg/L)	Aldrin (mg/L)	Anthracene (mg/L)	alpha-BHC (mg/L)	beta-BHC (mg/L)	delta-BHC (mg/L)	gamma-BHC (Lindane) (mg/L)	Benzaldehyde (mg/L)	Benzo (a) anthracene (mg/L)	1,1-Biphenyl (mg/L)	bis(2-chloroethyl) ether (mg/L)	Bis (2-ethylhexyl) phthalate (mg/L)
BACKGROUND SAMPLES														
GW-10	24-Jan-01	<0.01	<0.01	<0.00005	<0.01	<0.00005	<0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	0.008 LJ
GW-11	25-Jan-01	<0.01	<0.01	<0.00005	<0.01	<0.00005	<0.00005	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01
Screening Level [5]		0.044	None	0.00013	0.00018	0.025	None	None	0.000016	None	None	None	None	None

TABLE 10 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Butylbenzyl phthalate (mg/L)	Capro-lactam (mg/L)	Carbazole (mg/L)	alpha-Chlordane (mg/L)	Chrysene (mg/L)	Dibenzo-furan (mg/L)	Di-ethyl phthalate (mg/L)	Di-n-butyl phthalate (mg/L)	4,4-DDD (mg/L)	4,4-DDE (mg/L)	4,4-DDT (mg/L)	Dieldrin (mg/L)	Endo-Sulfan (mg/L)	Endrin (mg/L)	Fluor anthene (mg/L)	Fluorene (mg/L)
BACKGROUND SAMPLES																	
GW-10	24-Jan-01	<0.01	<0.01	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
GW-11	25-Jan-01	<0.01	<0.01	<0.01	<0.0001	<0.01	<0.01	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
Screening Level [5]		0.147	None	None	None	None	0.065	0.58	0.005	0.00005	0.00014	0.000001	0.000002	0.000009	0.000002	0.00296	0.05

TABLE 10 - SUMMARY OF SEMI-VOLATILE ORGANIC CONCENTRATIONS IN GROUNDWATER SAMPLES

Sample ID	Date Sampled	Heptachlor (mg/L)	Heptachlor epoxide (mg/L)	2-Methyl-phenol (mg/L)	4-Methyl phenol (mg/L)	2-Methyl naphthalene (mg/L)	Naph-thalene (mg/L)	2,2-oxybis (1-chloropropane) (mg/L)	Phenan threne (mg/L)	Phenol (mg/L)	Pyrene (mg/L)
BACKGROUND SAMPLES											
GW-10	24-Jan-01	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
GW-11	25-Jan-01	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Screening Level [5]		0.000004	0.0000036	1.02	None	0.06	0.25	None	0.0046	5.5	0.00024

Notes:

1. L= Reported concentration is below the Contract Required Quantitation Limit.
2. NA = Not analyzed.
3. v= Low biased. Actual concentration may be higher than the concentration reported.
4. J= Estimated value.
5. From Table 3-2 of TCEQ "Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas".
6. Shaded values exceed screening level.

Table 11. TERRESTRIAL HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Invertebrates	Earthworm	Protection of soil invertebrate community from uptake and direct toxic effects on detritivore abundance, diversity, productivity due to chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the abundance, diversity, productivity, and function? 2) Do soil to earthworm BAFs suggest uptake of chemicals?	Maximum soil concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Small mammalian herbivore	Deer mouse	Protection of the small mammal survival, growth, and reproduction due to uptake of chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the survivial, growth, and reproduction? 2) Do soil to mammal BAFs suggest uptake of chemicals?	Maximum soil concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Mammalian predator	Coyote	Protection of the mammalian predator survivial, growth, and reproduction due to the uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil to mammal BAFs suggest uptake of chemicals?	Maximum soil concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Reptilian predator	Ratsnake	Protection of the reptilian predator survivial, growth, and reproduction due to the uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil to mammal BAFs suggest uptake of chemicals?	Maximum soil concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian herbivore/omnivore	American robin	Protection of the omnivorous avian survivial, growth, and reproduction due to uptake of chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil to avian omnivore BAFs suggest uptake of chemicals?	Maximum soil concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian predator	Red-tailed hawk	Protection of carnivorous avian community population abundance, diversity, and productivity due to uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil to higher trophic level BAFs suggest uptake of chemicals and/or bioaccumulation?	Maximum soil concentrations do not exceed screening criteria.	1) Comparison of 95 percent upper confidence limit for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.

Notes:
SLERA -- Screening-Level Ecological Risk Assessment
BAF – biota accumulation factor
BSAF – biota to sediment accumulation factor
NOAEL – no observable adverse effects level

TABLE 12. ESTUARINE WETLAND AND AQUATIC HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Benthos and zooplankton	Polychaetes	Protection of benthic invertebrate community from uptake and direct toxic effects on abundance, diversity, and productivity due to chemicals in sediment.	1) Does exposure to chemicals in sediment adversely affect the abundance, diversity, productivity, and function? 2) Do sediment to biota BSAFs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Fish and shellfish	Fiddler crab	Protection of invertebrate community abundance, diversity, and productivity due to uptake of chemicals in sediment.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment to biota BSAFs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Killifish	Protection of localized herbivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment and biota.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment to biota BSAFs suggest uptake of chemicals?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Carnivorous fish	Black drum	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment and prey items.	1) Does exposure to chemicals in sediment and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivorous fish? 2) Do sediment to biota BSAFs suggest uptake of chemicals and/or bioaccumulation?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Spotted seatrout	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in prey items.	1) Does exposure to chemicals in prey items adversely affect the survival, growth, and reproduction of a second order carnivorous fish? 2) Does sediment to biota BSAF suggest bioaccumulation?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian predator	Sandpiper	Protection of carnivorous avian survival, growth, and reproduction due to uptake of chemicals in sediment and prey items.	1) Does exposure to chemicals in sediment and/or prey items adversely affect the survival, growth,and reproduction of a first order carnivore? 2) Does sediment to biota BSAF suggestion uptake or bioaccumulation?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Green heron	Protection of carnivorous avian survival, growth and reproduction due to uptake of chemicals in prey items.	1) Does exposure to chemicals in prey items adversely affect the survival, growth, and reproduction of a second order carnivore? 2) Does sediment to biota BSAF suggestion bioaccumulation?	Maximum sediment concentrations do not exceed screening criteria.	1) Comparison of maximum concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.

Notes:
SLERA – Screening-Level Ecological Risk Assessment
BAF – biota accumulation factor
BSAF – biota to sediment accumulation factor
NOAEL -- no observable adverse effects level

FIGURES

TEXAS

QUADRANGLE LOCATION

N

Scale in Feet

0 1000 2000

Source:
Base map taken from http://www.tnris.state.tx.us Freeport, Texas 7.5 min. U.S.G.S. quadrangle, 1974.

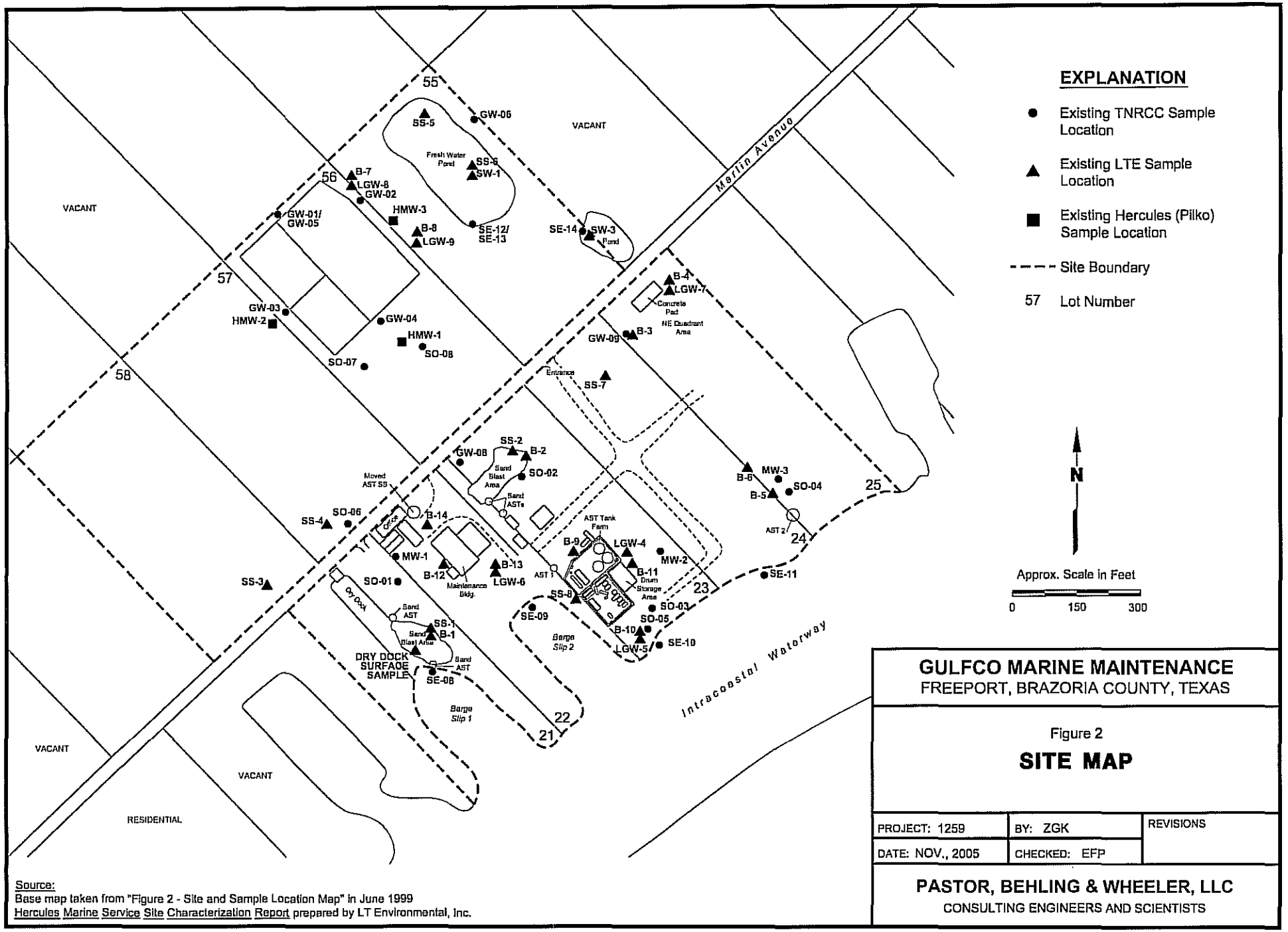
GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 1

SITE LOCATION MAP

PROJECT: 1259	BY: ZGK	REVISIONS
DATE: NOV., 2005	CHECKED: EFP	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS



Source:
Base map taken from "Figure 2 - Site and Sample Location Map" in June 1999 Hercules Marine Service Site Characterization Report prepared by LT Environmental, Inc.

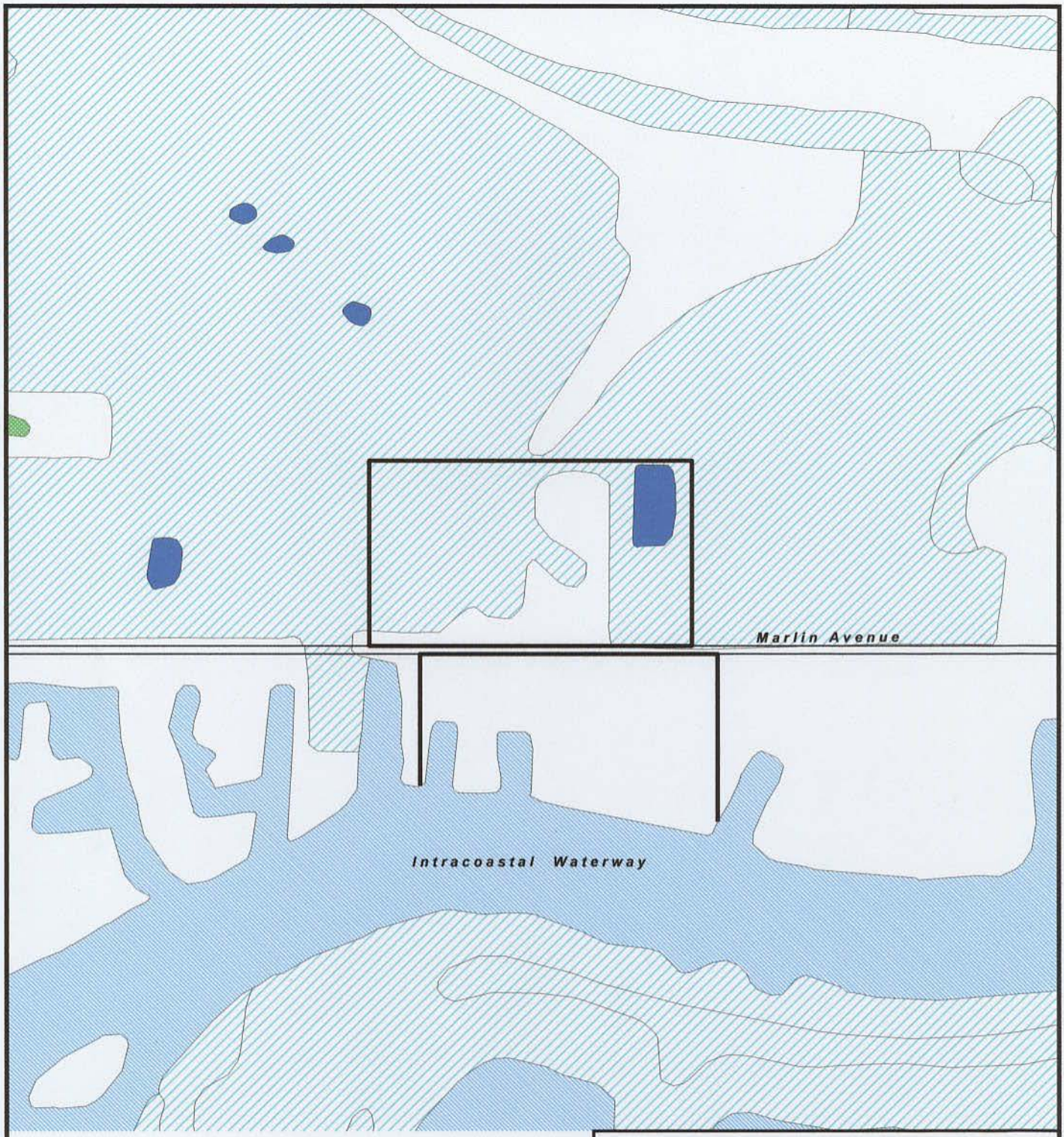
GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 2

SITE MAP

PROJECT: 1259	BY: ZGK	REVISIONS
DATE: NOV., 2005	CHECKED: EFP	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS



EXPLANATION

- Approx. Site Boundary
- Upland Area
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Pond

Approx. Scale in Feet

0 300 600

Source:
Base map taken from U.S. Fish & Wildlife Service, Wetlands Online Mapper.

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 3

WETLAND MAP

PROJECT: 1259	BY: ZGK	REVISIONS
DATE: NOV., 2005	CHECKED: EFP	

PASTOR, BEHLING & WHEELER, LLC
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EXPLANATION

Approx. Site Boundary

SE-05 ● Approx. Off-Site Sediment Sample Location. Collected During the January 2000 SSI Sampling Event in the Intercoastal Waterway and Oyster Creek.

N

Scale in Feet

0 1500 3000

Source:
Base map taken from http://www.tnris.state.tx.us Freeport, Texas 7.5 min. U.S.G.S. quadrangle, 1974.

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 4

OFF-SITE SEDIMENT SAMPLE LOCATIONS

PROJECT: 1259	BY: ZGK	REVISIONS
DATE: NOV., 2005	CHECKED: EFP	

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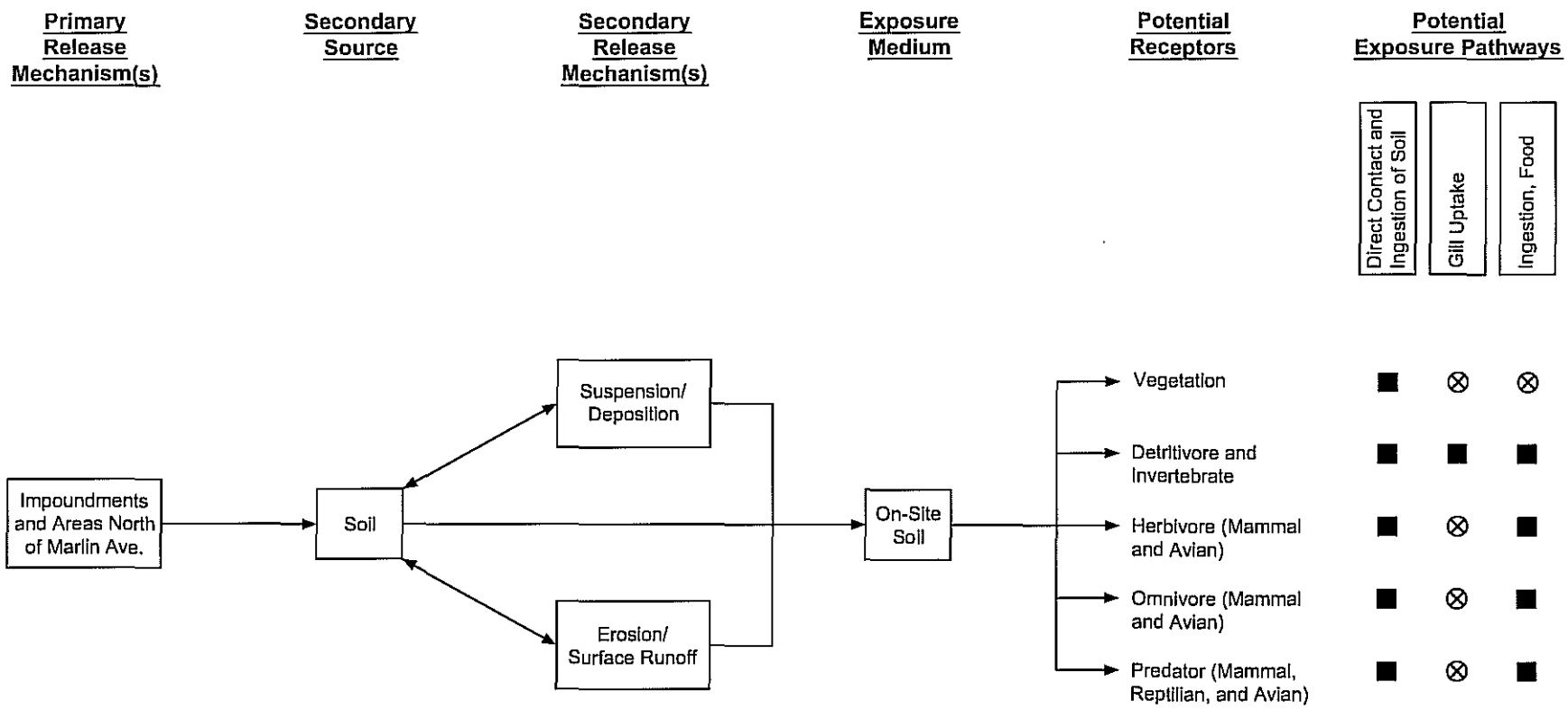

LEGEND

■ Pathway is potentially complete

⊠ Pathway is incomplete

⊗ Pathway is not viable

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 5

TERRESTRIAL ECOSYSTEM CONCEPTUAL SITE MODEL

PROJECT: 1259	BY: ZGK	REVISIONS
DATE: NOV., 2005	CHECKED: KHT	

PASTOR, BEHLING & WHEELER, LLC
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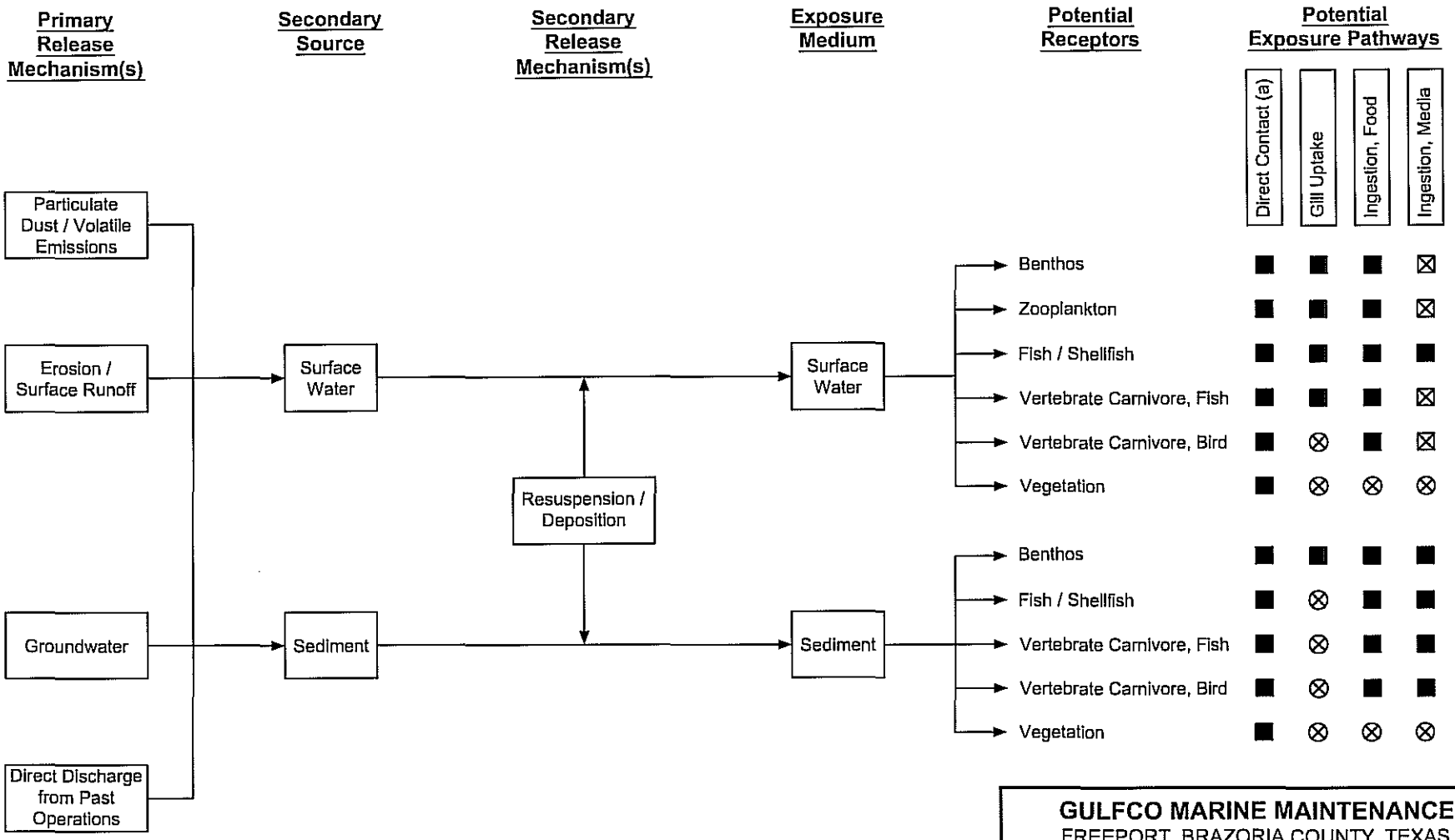

LEGEND

- ■ Pathway is potentially complete
- ⊠ Pathway is incomplete
- ⊗ Pathway is not viable
- (a) Direct contact includes dermal absorption

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 6

ESTUARINE ECOSYSTEM CONCEPTUAL SITE MODEL

PROJECT: 1259	BY: ZGK	REVISIONS
DATE: NOV., 2005	CHECKED: KHT	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

APPENDIX A

LTE DATA VALIDATION

Level II Data Evaluation Checklist	
Client Name: PBW	Client Project Number: 1259
Affected Property: Gulfco Marine Maintenance SF	Project Manager: Eric Pastor
Laboratory: Specialized Assays, Inc.	Laboratory Job No.: 135258, 135531, 135679
Reviewer: Taryn Scholz (QAA)	Date Checked: 8/3/05

SUMMARY COMMENTS:

SAMPLES

Samples were collected on 3/16/99 through 3/18/99 as part of a Site Characterization by LT Environmental, Inc. (Denver). Specialized Assays, Inc. (Nashville) analyzed the samples and submitted the results in Level II packages. A portion of the data was reviewed as indicated below:

SDG	Sample ID	Analyses Reviewed
135531	B1-0-6"	RCRA8+Be
135531	B2-0-6"	RCRA8+Be
135531	B2-3'	RCRA8+Be
135531	B3-3'	VOC, TPH-DRO
135531	B4-3'	VOC, TPH-DRO
135531	B5-3'	VOC, TPH-DRO
135531	B7-3'	VOC, TPH-DRO
135531	B8-3'	VOC, TPH-DRO
135531	B10-3'	VOC, SVOC, TPH-DRO
135531	B14-3'	VOC
135531	RB1 (Rinsate Blank)	RCRA8
135679	SS3	RCRA8+Be
135679	SS4	RCRA8+Be
135258	SS5	VOC, TPH-DRO, RCRA8
135258	SS6	VOC, TPH-DRO, RCRA8
135258	SS8	VOC, TPH-DRO
135258	MW1	VOC(1)
135258	MW2	VOC(1)
135258	MW3	VOC
135258	GWA (Field Duplicate of MW3)	VOC
135258	SW1	VOC
135258	SW2	VOC(1)
135258	SW3	VOC
135258	SW4	VOC
135258	Trip Blank (3/16/99)	VOC
135679	GW4	VOC
135679	GW5	VOC
135679	GW6	VOC, RCRA8+Be(1)
135679	GW7	VOC
135679	GW8	VOC(1)
135679	GW9	VOC
135679	Trip Blank (3/18/99)	VOC

VOC – 64 Volatile Organic Compounds by SW846-8260B
SVOC – 64 Semi Volatile Organic Compounds by SW846-3550/8270C
TPH-DRO – Total Petroleum Hydrocarbons (Diesel Range) by SW846-3550/8015B
RCRA8 – As, Ba, Cd, Cr, Pb, Hg, Se, Ag by SW846-6010B/7470/7471

(1) The following pages are missing from the packages and thus were not included in the review:

Sample ID	Missing Pages	Missing Results
MW1	2 of 2	27 of 64 VOCs (plus 3 of 3 Surrogate Recoveries)
MW2	1 of 2	37 of 64 VOCs
SW2	2 of 3	27 of 64 VOCs (plus 3 of 3 Surrogate Recoveries)
GW6	2 of 3	27 of 64 VOCs (plus 1 of 4 Surrogate Recoveries), 9 of 9 Metals
GW8	2 & 3 of 3	27 of 64 VOCs (plus 4 of 4 Surrogate Recoveries)

Level II Data Evaluation Checklist	
Client Name: PBW	Client Project Number: 1259
Affected Property: Gulfco Marine Maintenance SF	Project Manager: Eric Pastor
Laboratory: Specialized Assays, Inc.	Laboratory Job No.: 135258, 135531, 135679
Reviewer: Taryn Scholz (QAA)	Date Checked: 8/3/05

COMMENTS:

LABORATORY REPORTING PROCEDURES

- Level II package with Analytical Reports and QC Summary Forms (narrative not included)
- Analytical Reports include Result (numerical concentration or 'ND'), Report Limit, Quan Limit
- Report Limit is Quan Limit corrected for dilution, preparation, etc. (i.e., Report Limit should be used for NDs)
- Results reported down to Report Limit (i.e., no J-values) in mg/L (aqueous) or mg/kg (soil/sediment)
- Percent Moisture not reported (i.e. assume soils/sediments on wet-weight basis)
- Aqueous metals results are dissolved

QC PROCEDURES

- one LCS for each batch, spiked with all target analytes
- one MS/MSD for each batch, spiked with subset of target analytes
- Parent ID not reported for MS/MSD but it appears non-project samples were used based on unspiked sample results
- Laboratory limits used for review with minimum lower limit of 10% for organics and 30% for metals

VOC ANALYSES

A small amount (0.003-0.0055 mg/L) of Bromobenzene and/or Methylene Chloride is reported in the laboratory blanks for the aqueous samples. For these analytes, the samples are all reported as Not Detected (ND) and thus the data is not affected.

For solid batch number 2828, the percent recovery for Hexachlorobutadiene in the LCS is 0%, which is below the minimum threshold of 10%. For this analyte, the three affected samples (SS5, SS6, SS8) are reported as Not Detected (ND) and the validator qualified each result as rejected (R). The presence or absence of this analyte cannot be determined and thus the data is not suitable for use.

SVOC ANALYSES

For solid batch number 5310, the percent recovery for 3,3'-Dichlorobenzidene in the LCS is 0%, which is below the minimum threshold of 10%. For this analyte, the affected sample (B10-3') is reported as Not Detected (ND) and the validator qualified the result as rejected (R). The presence or absence of this analyte cannot be determined and thus the data is not suitable for use.

TPH ANALYSES

No deficiencies affecting data quality were noted.

METALS ANALYSES

No deficiencies affecting data quality were noted.

COMPLETENESS AND OVERVIEW

The attached table shows all flags applied by the validator. Results for three VOC analytes and one SVOC analyte are rejected for use. Additionally, some data is missing as noted above. All other data is considered usable with no qualification.

Level II Data Evaluation Checklist				
Client Name: PBW	Project Number:			
Affected Property: Gulfco	Project Manager: Eric Pastor			
Laboratory: Specialized Assays, Inc.	Laboratory Job No.: 135258, 135531, 135679			
Reviewer: Taryn Scholz (QAA)	Date Checked: 8/3/05			
ITEM	**Yes**	**No**	**N/A**	**Comments**
Chain of Custody (COC) and Sample Receipt at Lab				
1. Signed COCs included?	x			
2. Date and time of sample collection included?	x			
3. Samples analyzed for the requested parameters?	x			
4. Field QC included?	x			
5. Sample receipt temperature 2-6°C ?	x			Not noted on one COC
6. Samples preserved appropriately?	x			Assumed since no problems noted by lab
7. Qualification of field sample results not required based on sample preservation?	x			
8. No other problems noted?	x			
Laboratory Report and Sample Results				
9. Field sample IDs included?	x			
10. Laboratory sample IDs included?	x			
11. Date of analysis included?	x			
12. Date of sample preparation included?	x			
13. Method references included?	x			
14. Sample matrix included?	x			Not included on Chain
15. Sample result units reported correctly?	x			
QC Results				
16. Field samples prepared and analyzed within holding times?	x			VOC, SVOC(extraction), TPH - 7 days aq/ 14 days sol; Hg - 28 days, Metals- 6 mos
17. Qualification of field sample results not required based on holding times?	x			
18. Method blank results <LOQ?		x		VOC Batch 3766: Methylene Chloride 0.003 mg/L (no flags, all samples ND) VOC Batch 4232: Bromo-benzene 0.0042 mg/L, Methylene Chloride 0.0055 mg/L (no flags, all samples ND)
19. Qualification of field sample results not required based on method blank results?	x			
20. Field/Rinse/Trip blank results <LOQ?	x			
21. Qualification of field sample results not required based on field blank results?	x			
22. Surrogate recoveries within limits?	x			Missing recoveries for some samples (no flags, LCS used to verify accuracy)
23. Qualification of field sample results not required based on surrogate recoveries?	x			

Level II Data Evaluation Checklist				
Client Name: PBW	Project Number:			
Affected Property: Gulfco	Project Manager: Eric Pastor			
Laboratory: Specialized Assays, Inc.	Laboratory Job No.: 135258, 135531, 135679			
Reviewer: Taryn Scholz (QAA)	Date Checked: 8/3/05			
ITEM	**Yes**	**No**	**N/A**	**Comments**
24. LCS/LCSD recoveries within limits?		x		Missing recoveries for some TAs in VOC batch 4232 (no flags, other TAs used to verify accuracy) VOC Batch 2828: Hexachloro-butadiene 0% (R/JL to NDs/detects) SVOC Batch 5310: 3,3'DCB 0% (R/JL to NDs/detects)
25. Qualification of field sample results not required based on LCS/LCSD recoveries?		x		Hexachlorobutadiene: R to SS8, SS5, SS6 3,3'-Dichlorobenzidine: R to B10-3'
26. LCS/LCSD RPDs within limits?			x	
27. Qualification of field sample results not required based on LCS/LCSD RPDs?	x			
28. MS/MSD recoveries within limits?		x		No MS/MSD for TPH Batch 4636 (no flags, LCS used to verify accuracy) Metals Batch 4322: Ba 73%, Cr 41%, Pb 55%, Ag 62% (no flags, non-project sample used to prepare MS/MSD)
29. Qualification of field sample results not required based on MS/MSD recoveries?	x			
30. MS/MSD RPDs within limits?		x		VOC Batch 4232: Benzene 22% (no flags, non-project sample used to prepare MS/MSD)
31. Qualification of field sample results not required based on MS/MSD RPDs?	x			
32. Laboratory duplicate RPDs within limits?			x	
33. Qualification of field sample results not required based on lab duplicate RPDs?	x			
34. Field duplicate RPDs within limits?	x			both samples all ND
35. Qualification of field sample results not required based on field duplicate RPDs.	x			
Definitions: RL – Reporting Limit; IDL – Instrument Detection Limit; MDL – Method Detection Limit; LOQ – Limit of Quantitation; ND – Not Detected; LCS/LCSD – Laboratory Control Sample/Laboratory Control Sample Duplicate; MS/MSD – Matrix Spike/Matrix Spike Duplicate				

GULFCO QUALIFIED DATA TABLE			
Field Sample Identification	**Analyte**	**Qualifier Assigned**	**Reason for Qualification**
SS5	Hexachlorobutadiene	R	extremely low (0%) recovery in LCS
SS6	Hexachlorobutadiene	R	extremely low (0%) recovery in LCS
SS8	Hexachlorobutadiene	R	extremely low (0%) recovery in LCS
B10-3'	3,3-Dichlorobenzidine	R	extremely low (0%) recovery in LCS

U – Blank affected; The analyte was not detected significantly above the level in an associated blank.
UJ – Estimated data; The analyte was not detected above the reporting limit, however the limit is approximate due to exceedance of one or more QC requirements.
J – Estimated data; The reported sample concentration is approximate due to exceedance of one or more QC requirements.
R – Rejected data; Serious QC deficiencies make it impossible to verify the absence or presence of this analyte.

H – Bias in sample result is likely to be high
L – Bias in sample result is likely to be low